

User Manual

INDOOR DOME IP CAMERA





WARNINGS

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.

DO NOT INSERT ANY METALLIC OBJECT THROUGH VENTILATION GRILLS.

CAUTION

	<div>CAUTION</div> <div>RISK OF ELECTRIC SHOCK DO NOT OPEN</div>	
<p>CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK. DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.</p>		

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THE TRADEMARKS MENTIONED IN THE MANUAL ARE LEGALLY REGISTERED TO THEIR RESPECTIVE COMPANIES.

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I. Preface

This IP Camera is a 1.3 megapixel dome IP camera with the web server built in. User can view real-time video via IE browser. IP Camera supports simultaneously H.264, Motion JPEG & MPEG4 video compression and dual streaming which provides smooth and high video quality. The video can be stored in the SD card and played back remotely. With user friendly interface, it is an easy-to-use IP camera which is designed for security application.

II. Product Specifications

Main Features:

- 1.3 Mega Indoor IP Camera
- Support HD 720P Real Time
- Digital Noise Reduction
- Digital Wide Dynamic Range
- Shutter Speed Adjustable
- Sense Up Adjustable
- Day&Night Switch Time Control Manfully (Option)
- Power over Ethernet (Option)
- H.264/ M-JPEG/ MPEG4 Compression
- Micro SD Card Backup
- Support iPhone/Android/Mac
- SDK for Software Integration
- Free Bundle 36 ch Recording Software

Fixed Lens Model

	PoE Model	IR Model	PoE + IR
Hardware			
CPU	ARM 9 ,32 bit RISC		
RAM	128MB		
Flash	16MB		
Image sensor	1 / 4" Mega-Pixel CMOS sensor		
Sensitivity	B / W: 0.5 Lux (AGC ON)	Color : 1 Lux (AGC ON)	B / W: 0.5 Lux (AGC ON)
Shutter Time	1 / 10~ 1 / 10,000 sec		
Lens Type	4.2mm @ F1.6		
Angle of View	52.6° (H), 32.9° (V)		

I/O	1 DI / 1 DO		
Audio	G.711(64K) and G.726(32K,24K) audio compression Input : External Mic in Output: External Audio out		
Power over Ethernet	Yes	No	Yes
Max Power Consumption	12V DC : 2.4W PoE : 2.88W	12V DC : 4.32W(IR On); 2.76W(IR Off)	12V DC : 3.24W(IR On); 2.76W(IR Off) PoE : 4.32W(IR On); 3.36W(IR Off)
Operating Temperature	0°C ~ 45°C		
Dimensions	131.2mm (Ø) x 94.3mm (H)		
IR LEDs (Option)			
LEDs	No	28 LEDs, 850nm,	7 LEDs, 850nm,
IR distance	No	16M	5M
Network			
Ethernet	10/ 100 Base-T		
Network Protocol	HTTP, HTTPS, SNMP, QoS/DSCP, Access list, IEEE 802.1X, RTSP, TCP/ IP, UDP, SMTP, FTP, PPPoE, DHCP, DDNS, NTP, UPnP, 3GPP, SAMBA, Bonjour		
System			
Video Resolution	1280x1024@20fps, 1280x720@30fps, ,640x480@30fps, 320x240@30fps, 176x144@30fps		
Video Adjust	Brightness, Contrast, Hue, Saturation, Sharpness, AGC, Shutter Speed adjustable, Sense-Up, D-WDR, Flip, Mirror, Noise reduction	Brightness, Contrast, Hue, Saturation, Sharpness, AGC, Shutter Speed adjustable, Sense-Up, D-WDR, Flip, Mirror, Noise reduction, Day&Night adjustable	
Triple Streaming	Yes		
Image Snapshot	Yes		
Full Screen Monitoring	Yes		
Privacy Mask	Yes, 3 different areas		

Compression Format	H.264/ M-JPEG/ MPEG4
Video Bitrates Adjust	CBR, VBR
Motion Detection	Yes, 3 different areas
Triggered Action	Mail, FTP, Save to Micro SD card, SAMBA, DO
Pre/ Post Alarm	Yes, configurable
Security	Password protection, IP address filtering, HTTPS encrypted data transmission, 802.1X port-based authentication for network protection, QoS/DSCP
Firmware Upgrade	HTTP mode, can be upgraded remotely
Simultaneous Connection	Up to 10
Micro SD card management	
Recording Trigger	Motion Detection, IP check, Network break down (wire only), Schedule, DI
Video Format	AVI, JPEG
Video Playback	Yes
Delete Files	Yes
Web browsing requirement	
OS	Windows 7, 2000, XP, 2003, Microsoft IE 6.0 or above, Chrome, Safari, Firefox.
Mobile Support	iOS 4.3 or above, Android 1.6 or above.
Hardware	
Suggested	Intel Dual Core 2.53G, RAM: 1024MB, Graphic card: 128MB
Minimum	Intel-C 2.8G, RAM: 512MB, Graphic card: 64MB

Vari-focal Model

	PoE Model	IR Model
Hardware		
CPU	ARM 9 ,32 bit RISC	
RAM	128MB	
Flash	16MB	
Image sensor	1 / 4" Mega-Pixel CMOS sensor	
Sensitivity	B / W: 0.5 Lux (AGC ON)	Color : 1 Lux (AGC ON) B / W: 0.5 Lux (AGC ON)
Shutter Time	1 / 10 ~ 1 / 10,000 sec	
Lens Type	2.8~10mm @ F1.2	
Angle of View	25.7°~88.1°(H), 16.1°~54.9°(V)	
I/O	1 DI / 1 DO	

Audio	G.711(64Kbps)/ G.726(24Kbps/32Kbps) audio compression Input : External Mic in Output: External Audio out	
Power over Ethernet	Yes	No
Max Power Consumption	12V DC: 2.4W PoE: 2.88W	12V DC : 4.08W (IR On); 2.52W(IR Off)
Operating Temperature	0°C ~ 45°C	
Dimensions	131.2mm (∅) x 94.3mm (H)	
IR LEDs (Option)		
LEDs	No	18 LEDs, 850nm,
IR distance	No	12M
Network		
Ethernet	10/ 100 Base-T	
Network Protocol	HTTP, HTTPS, SNMP, QoS/DSCP, Access list, IEEE 802.1X, RTSP, TCP/ IP, UDP, SMTP, FTP, PPPoE, DHCP, DDNS, NTP, UPnP, 3GPP, SAMBA, Bonjour	
System		
Video Resolution	1280x1024@20fps, 1280x720@30fps, ,640x480@30fps, 320x240@30fps, 176x144@30fps	
Video Adjust	Brightness, Contrast, Hue, Saturation, Sharpness, AGC, Shutter Speed adjustable, Sense-Up, D-WDR, Flip, Mirror, Noise reduction	Brightness, Contrast, Hue, Saturation, Sharpness, AGC, Shutter Speed adjustable, Sense-Up, D-WDR, Flip, Mirror, Noise reduction, Day&Night adjustable
Triple Streaming	Yes	
Image Snapshot	Yes	
Full Screen Monitoring	Yes	
Privacy Mask	Yes, 3 different areas	
Compression Format	H.264/ M-JPEG/ MPEG4	
Video Bitrates Adjust	CBR, VBR	
Motion Detection	Yes, 3 different areas	
Triggered Action	Mail, FTP, Save to Micro SD card, SAMBA, DO	
Pre/ Post Alarm	Yes, configurable	

Security	Password protection, IP address filtering, HTTPS encrypted data transmission, 802.1X port-based authentication for network protection, QoS/DSCP
Firmware Upgrade	HTTP mode, can be upgraded remotely
Simultaneous Connection	Up to 10
Micro SD card management	
Recording Trigger	Motion Detection, IP check, Network break down (wire only), Schedule, DI
Video Format	AVI, JPEG
Video Playback	Yes
Delete Files	Yes
Web browsing requirement	
OS	Windows 7, 2000, XP, 2003, Microsoft IE 6.0 or above, Chrome, Safari, Firefox.
Mobile Support	iOS 4.3 or above, Android 1.6 or above.
Hardware	
Suggested	Intel Dual Core 2.53G, RAM: 1024MB, Graphic card: 128MB
Minimum	Intel-C 2.8G, RAM: 512MB, Graphic card: 64MB

*SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

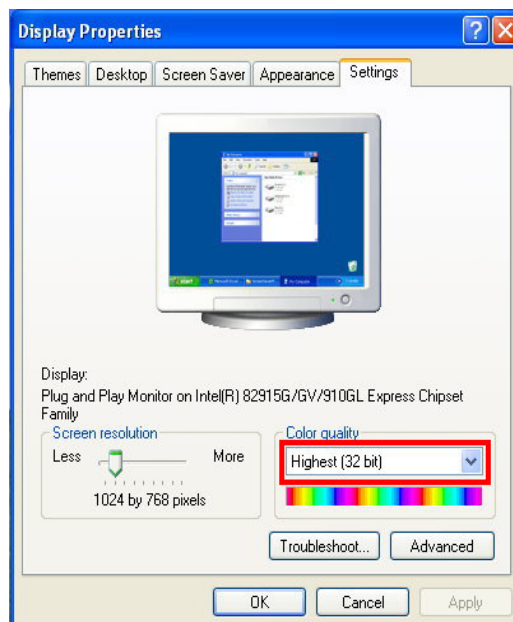
III. Product Installation

A. Monitor Setting

1. Right-Click on the desktop. Select “ Properties”



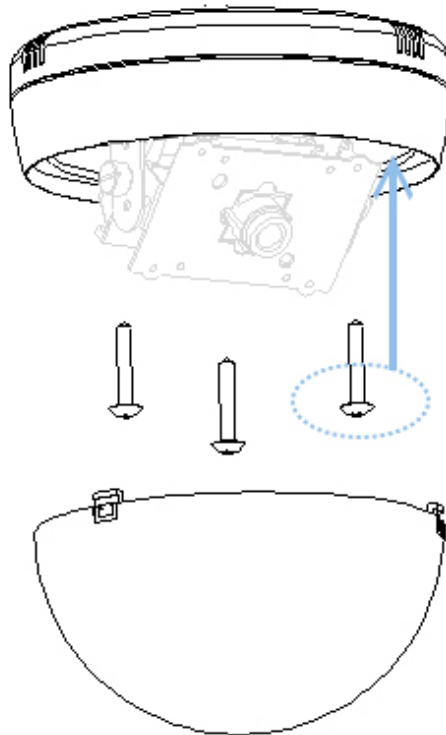
2. Change color quality to highest (32bit).



B. Hardware Installation

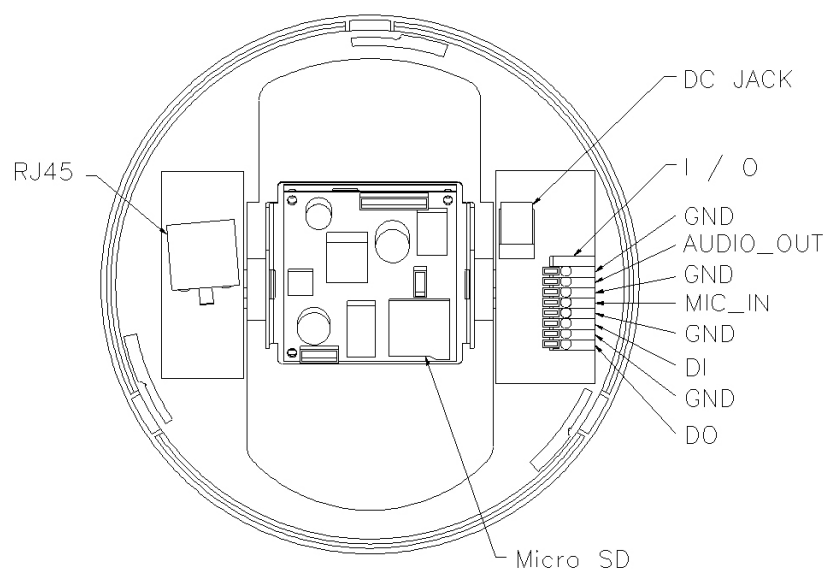
1. Camera Construction

Use the screws to lock the bracket to the wall or ceiling, adjust the angle of lens, and then close the cover.



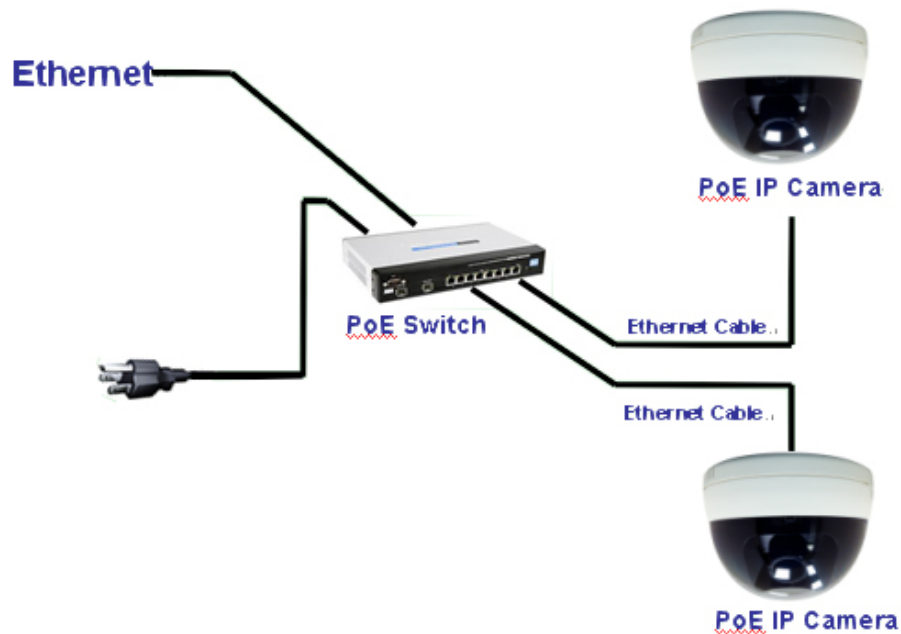
2. Connector Instruction

Connect power adaptor first, then connect the IP Camera to PC or network, and set up the network configurations according to the network environment. About I/O setting, please refer to chapter VII in User Manual: "[I/O Configuration](#)" for detail.



3. PoE (Power Over Ethernet)(Optional) **802.3af PoE Switch is recommended**

Power over Ethernet (PoE) is a technology that integrates power into a standard LAN infrastructure. It enables power to be provided to the network device, such as an IP phone or a network camera, using the same cable as that used for network connection. It eliminates the need for power outlets at the camera locations and enables easier application of uninterruptible power supplies (UPS) to ensure 24 hours a day, 7 days a week operation.

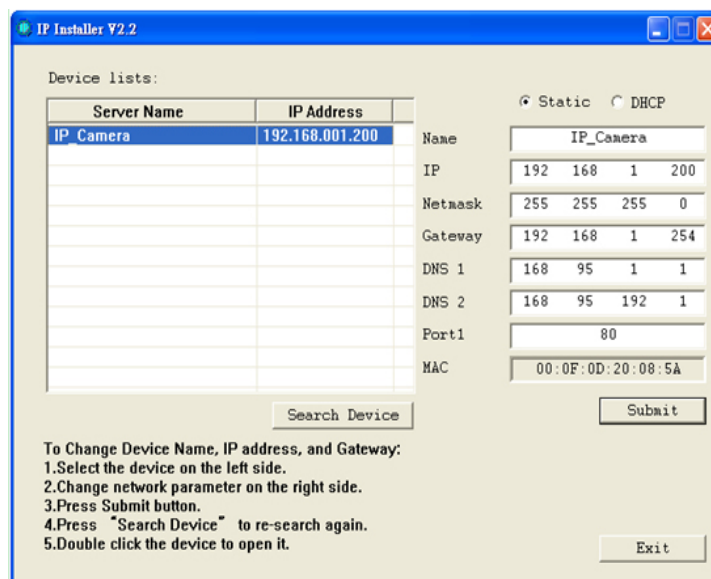


C. IP Assignment

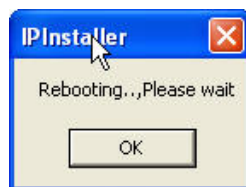
1. You can use the software "IP Installer" to assign the IP address of IP Camera. The software is in the attached CD.
2. There are two language versions of IP installer. Choose one as your need:
 IPInstallerCht.exe: Chinese version
 IPInstallerEng.exe: English version
3. There are 3 kinds of IP configuration.
 - a. Fixed IP (Public IP or Virtual IP)
 - b. DHCP (Dynamic IP)
 - c. Dial-up (PPPoE)
4. Execute IP Installer
5. For Windows XP SP2 user, the following message box may pop up. Please click "Unblock".



6. IP Installer configuration:



7. IP Installer will search for all IP Cameras connected on Lan. Click “Search Device” to refresh the result list.
8. Click one of the IP Camera listed on the left side. The network configuration of this IP camera shows on the right side. You may change the “name” of the IP Camera as your preference (eg: Office, warehouse). Change the parameter and click “Submit” . It will apply the change and reboot the Device.



9. Please make sure that the IP address of your PC and IP Camera are on the same subnet.

The same Subnet:

IP CAM IP address: 192.168.1.200

PC IP address: 192.168.1.100

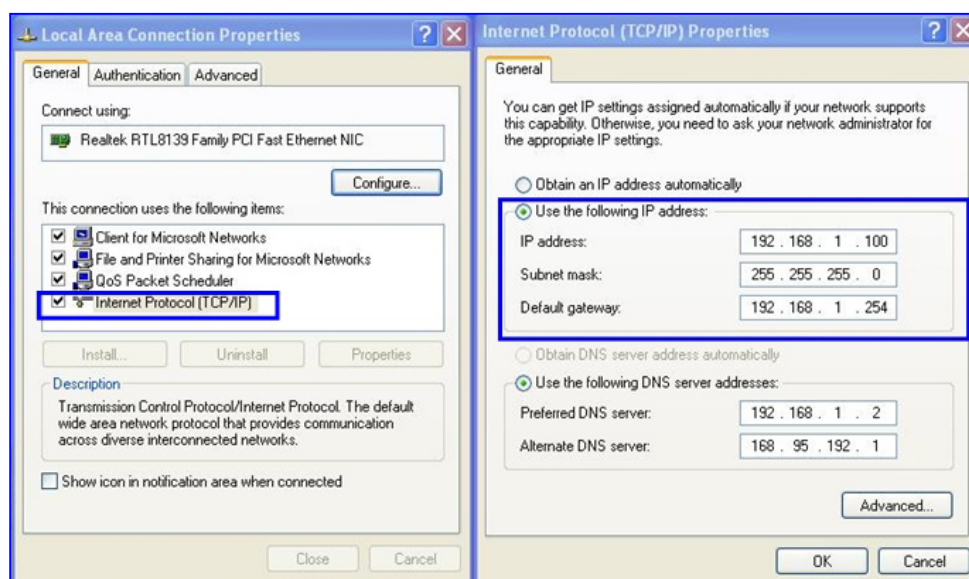
Different Subnets:

IP CAM IP address: 192.168.2.200

PC IP address: 192.168.1.100

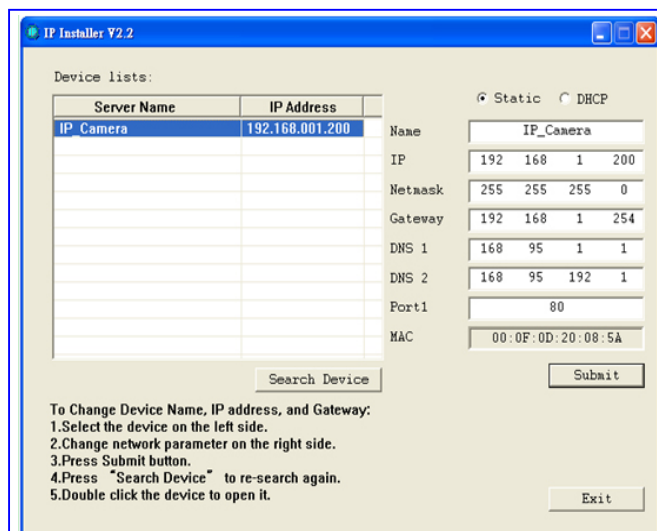
To Change PC IP address:

Control Panel→Network Connections→ Local Area Connection Properties→ Internet Protocol (TCP/IP) → Properties

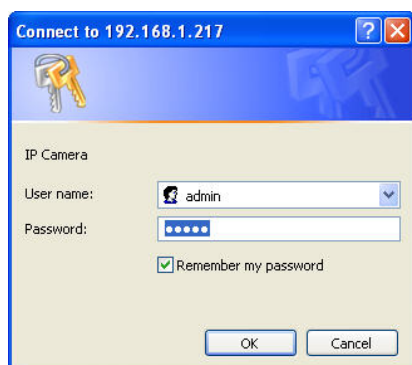


10. A quick way to access remote monitoring is to double-click the selected IP

Camera listed on "Device list" of IP Installer. An IE browser will be opened.



11. If you link to the IP Camera successfully, there pops a box asking you to log in. Please key in the default user name "admin" and password "admin" when you link to the IP Camera for the first time. You can revise the user name and password later. Please refer to Chapter V: "A.2. [User Management](#)".



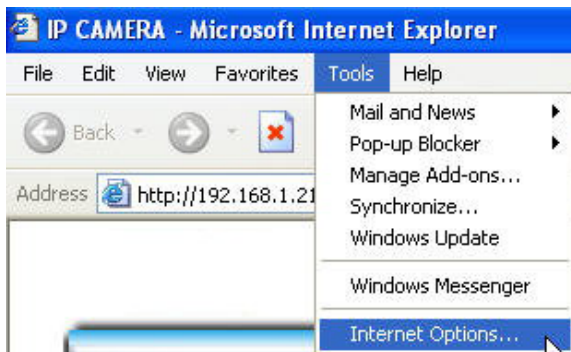
D. Install ActiveX control

1. To users of IE 6.0 above

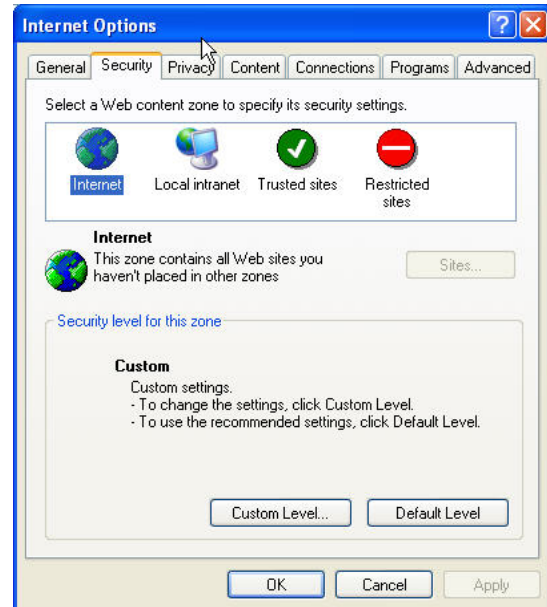
At the first time you access the camera via IE, it will ask you to install the ActiveX component. If the installation failed, please check the security setting for the IE browser.

- a. Follow the steps: IE → Tools → Internet Options... → Security Tab → Custom Level... → Security Settings.
 Find the option "Download unsigned ActiveX control" → Select "Enable" or Prompt.
 Find the option "Initialize and script ActiveX controls not marked as safe" → Select "Enable" or Prompt.

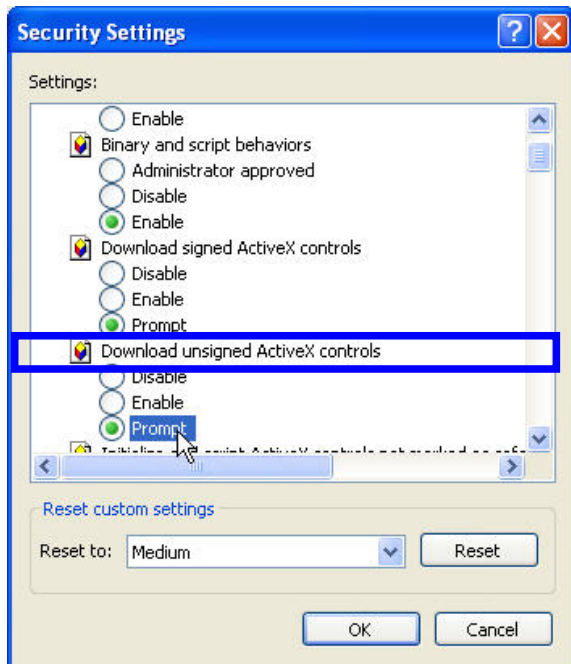
1



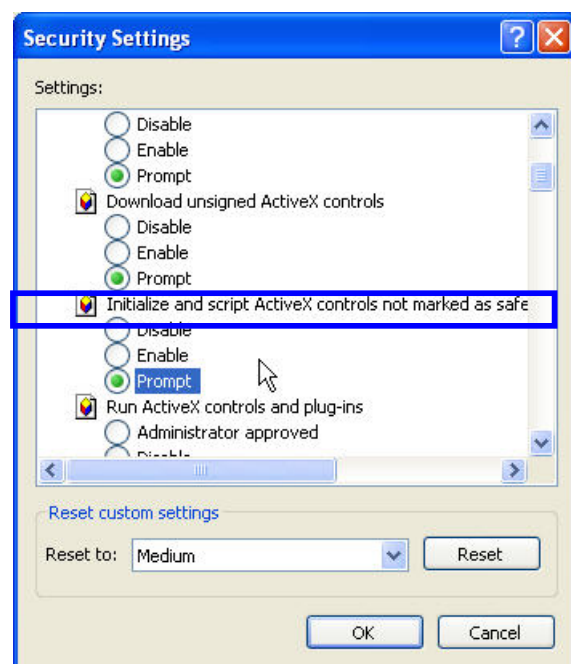
2



3

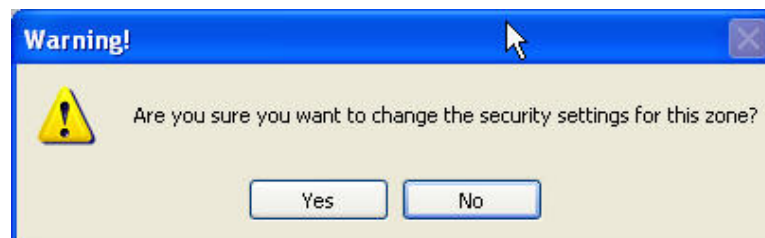


4

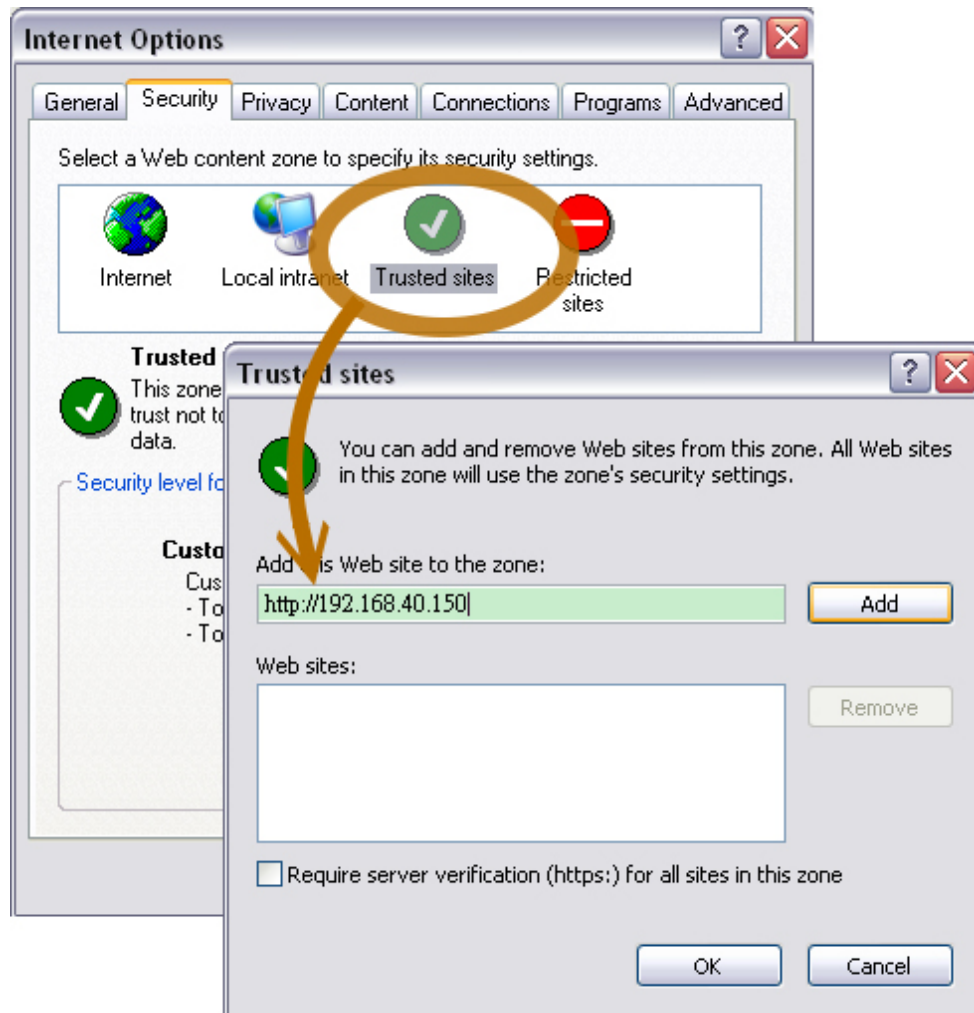


5

When popup the following dialogue box, click "Yes".



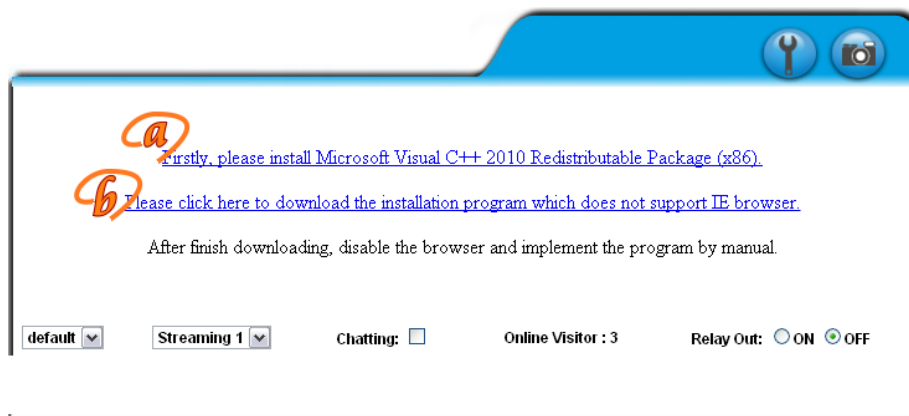
- b. You can choose another way. Go to: IE→Tools → Internet Options... → Security Tab → Trusted sites → Add the IP address and click "OK".
- In the site list you can key one single IP address or a LAN address. For example, if you add "192.168.21.*", all the IP address under .21 LAN will be regarded as trusted sites.



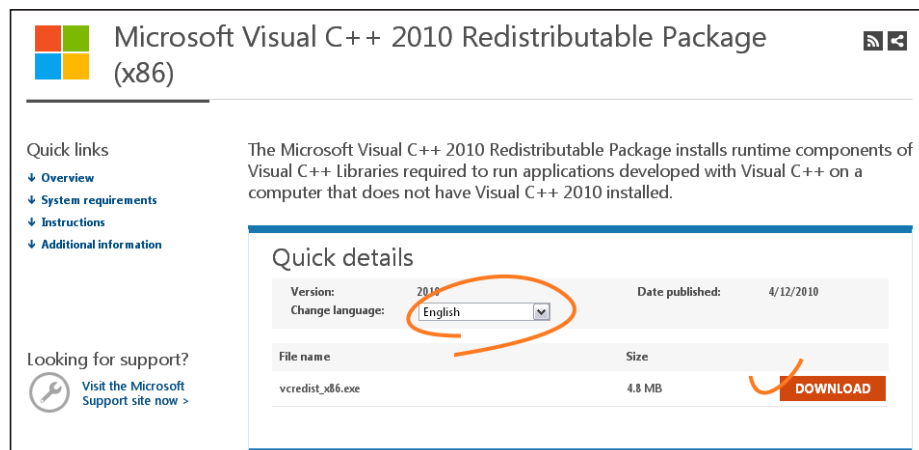
2. Use Non-IE Web Browser

If you use firefox or google chrome to access the IP camera but fail to watch the live video, please follow the steps to install necessary tools:
(the following pictures are based on chrome.)

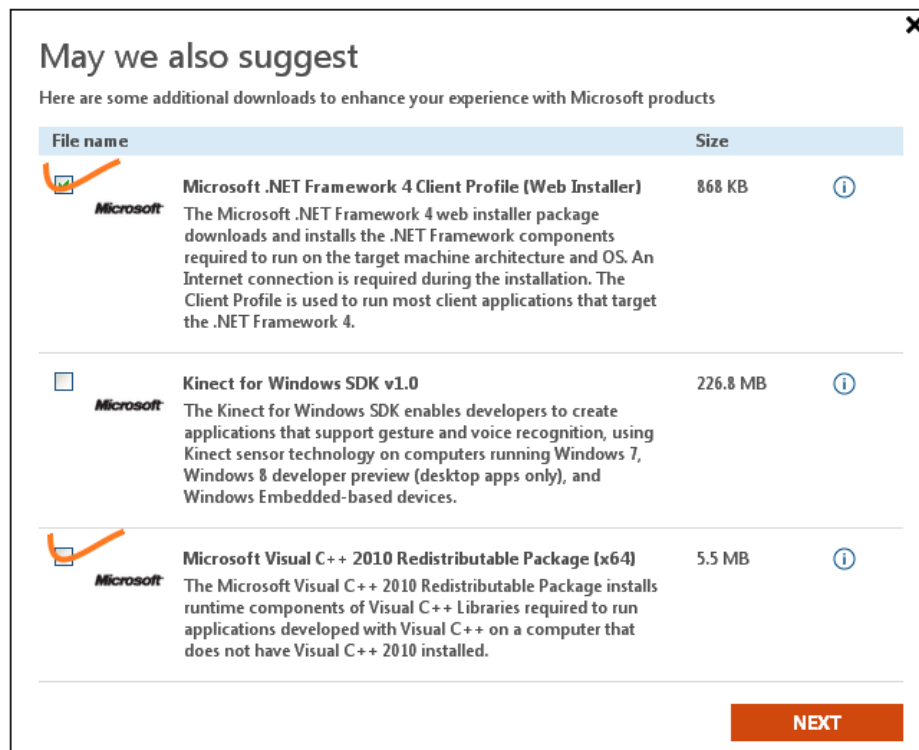
- a. You may see the prompt message as the picture below. First, Click the link:
"Firstly, please install Microsoft Visual C++ 2010 Redistributable Package (x86)."



- (i) The link conducts you to the Microsoft official site that you can download the tools. Please select the language and click "download".



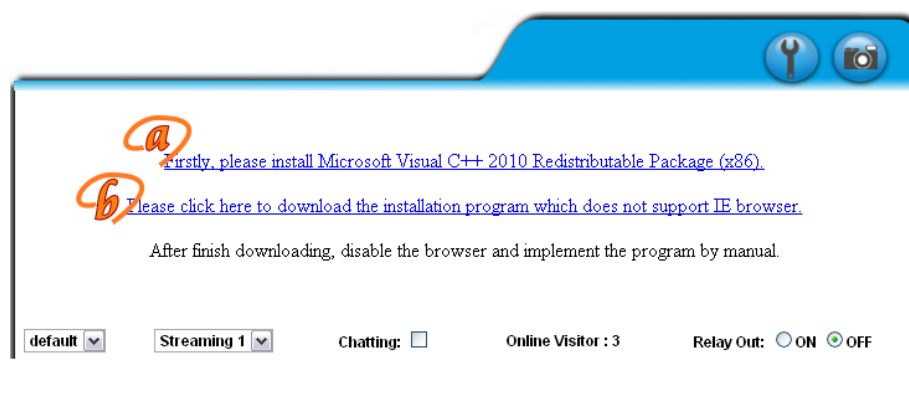
- (ii) In the pop-up window, please tick the first and the third file as the picture below. Click "Next" to download both "Microsoft .NET Framework 4 Client Profile (Web Installer)" and "Microsoft Visual C++ 2010 Redistributable Package (x64)".



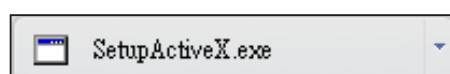
- (iii) After finishing downloading, execute the two files respectively to install them. The windows may ask you to reboot the PC when the installation finished.



- b. Then, Click the second link "Please click here to download the installation program which does not support IE browser." to download Setup ActiveX.

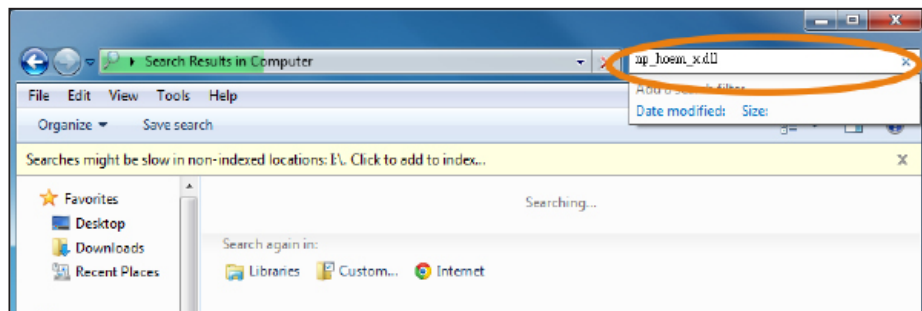


After finishing downloading, execute the files to install ActiveX. Then restart the browser.

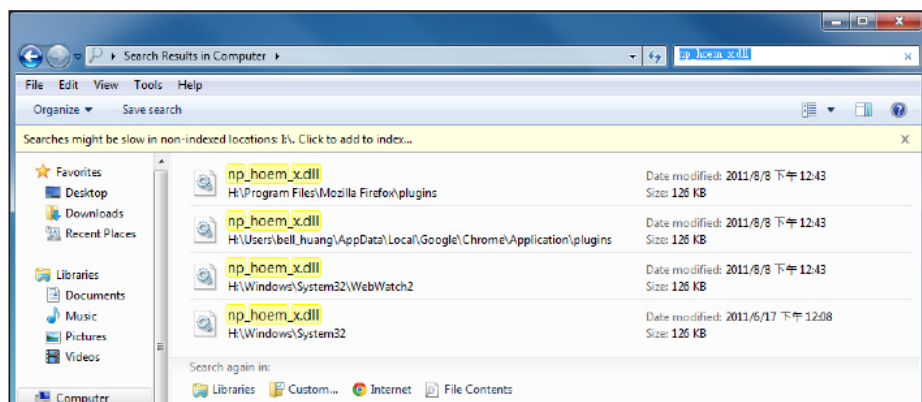


c. If you execute the steps above but still cannot see the live video normally, please try the solution:

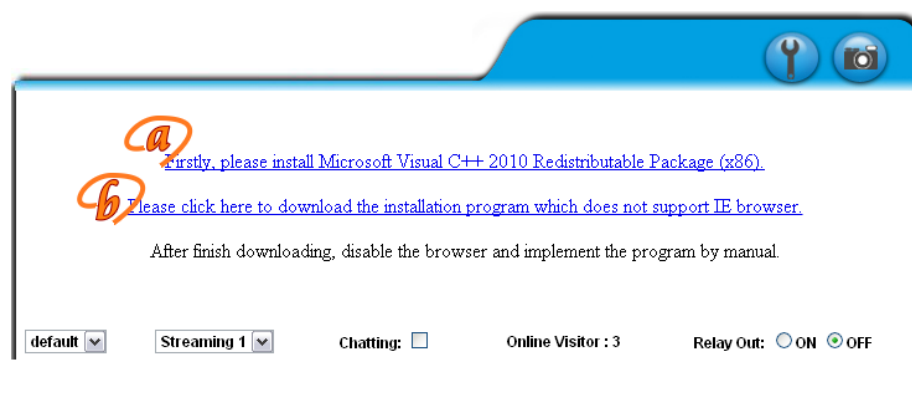
- (i) Search for the file "np_hoem_x.dll" in your system disk. For Windows XP users, please go to "Start" → "Search" → Search for "All files and folders" and key in "np_hoem_x.dll". For Windows 7 users, please use the search bar on the top-right of the Windows Explorer.



- (ii) Delete all the files named "np_hoem_x.dll". They're the ActiveX control tools having been installed in your computer, but the old version of ActiveX might not compatible with the new version of browser. Therefore, we delete them in order to install the latest ActiveX control.

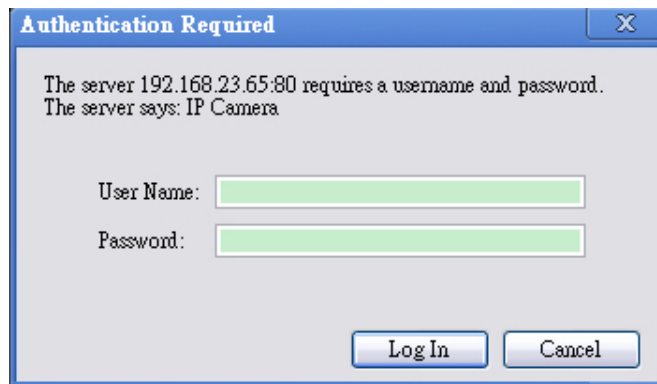


- (iii) Start your web browser, and repeat the step 2-b: "Download the installation program which does not support IE browser" to download and install ActiveX.

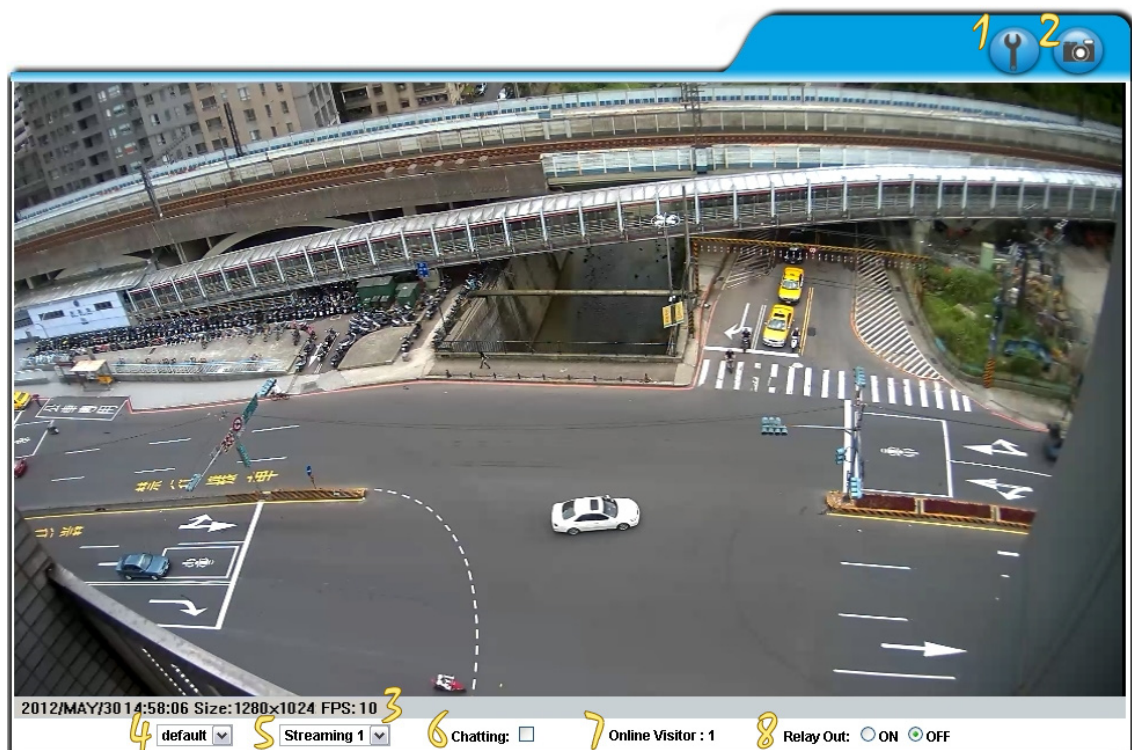


IV. Live Video



Start an IE browser, type the IP address of the IP camera in the address field. It will show the following dialogue box. Key-in the user name and password. The default user name and password are “admin” and “admin”.



When the IP Camera is connected successfully, it shows the following program interface.



Double-click the video to switch to full screen view. Press “Esc” or double-click the video again back to normal mode.

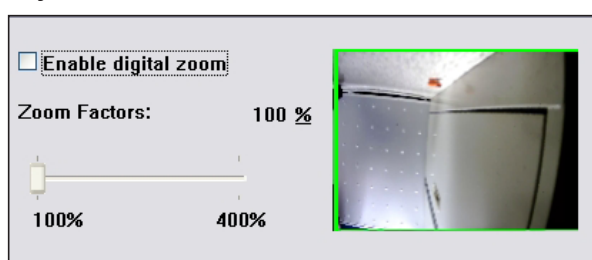
1.  : Get into the administration page
2.  : Video Snapshot

3. Show system time, video resolution, and video refreshing rate
4. Adjust image, 1/2x, 1x, 2x
5. Select video streaming source (If in "Video Setting" the streaming 2 setting is closed, this option will not appear here.)
6. IP Camera supports 2-way audio. Click the "Chatting" check box, then you can use microphone connected to the PC to talk to the Camera side.
7. Show how many people connect to this IP camera.
8. Tick the Relay out "ON" box to trigger the relay output for testing. Tick "Off" to stop triggering.

Snapshot	Null
Record Start	100
Mute	200
Full Screen	300
Zoom	400
FrameBuffmSec	500


Right-Click the mouse on the video, it will show a pop-up menu.


1. Snapshot: Save a JPEG picture
2. Record Start: Record the video in the local PC. It will ask you where to save the video. To stop recording, right-click the mouse again. Select "Record Stop". The video format is AVI. Use Microsoft Media Player to play the recorded file.
3. Mute: Turn off the audio. Click again to turn on it.
The "mute" button does not affect the playback recording video. As long as the "IP Camera to PC" option in the audio setting is enabled, all the audio will be recorded into the playback video even you click "mute" in the live page.
4. Full Screen: Full-screen mode.
5. Zoom: Enable zoom-in and zoom-out functions. Select "Enable digital zoom" option first within the pop-up dialogue box and then drag and drop the bar to adjust the zoom factors.

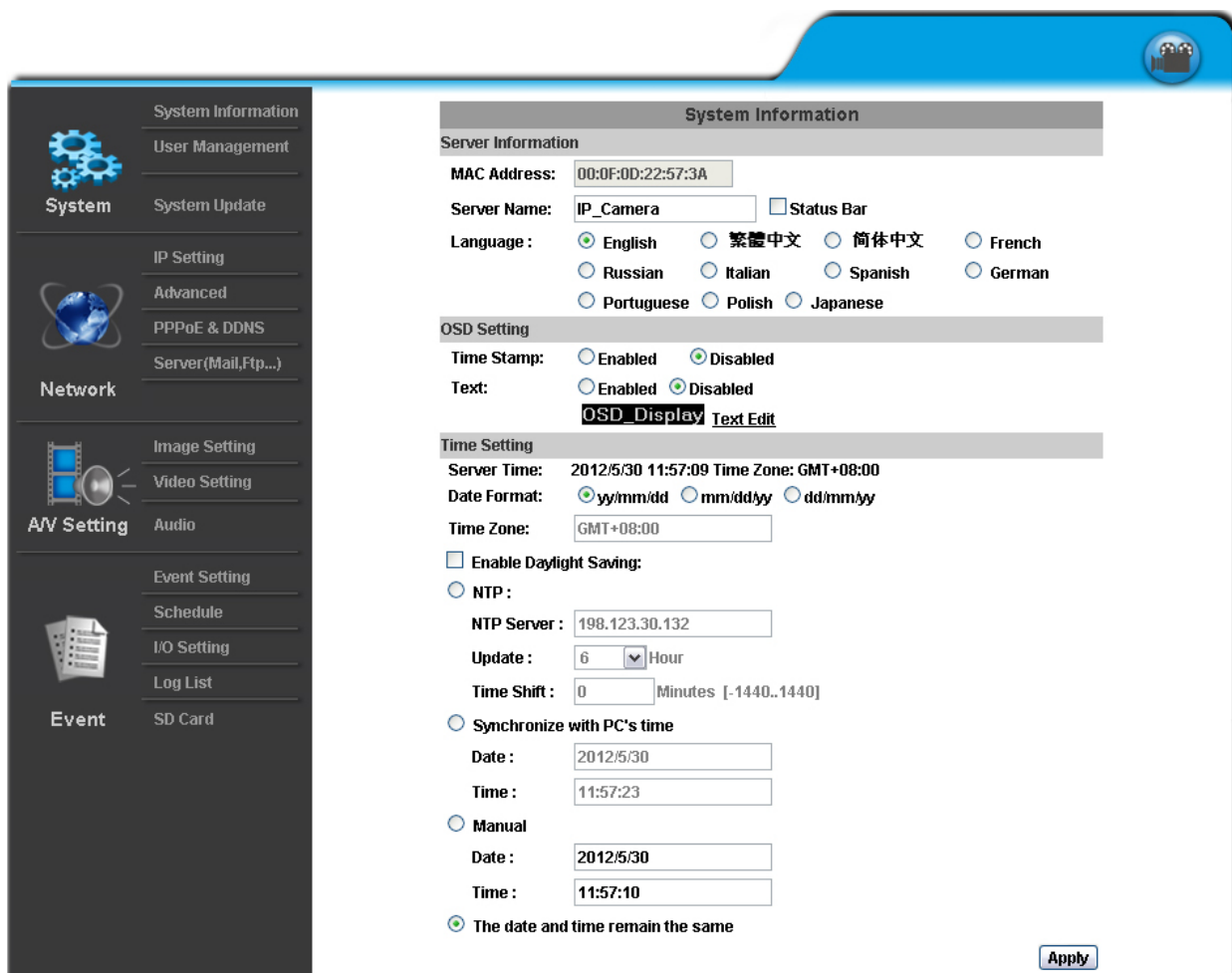


6. Frame Buffm Sec: This function is to build a temporary buffm to accumulate several video frame. This function can make video smooth-going when the Network speed is slow and lag. If you select "100", then it plays video after 100 mSec when starting receiving images from camera. The slower the Network is, the bigger value should be selected. The default value is null.

V. IP Camera Configuration

Click  to get into the administration page as below.

Click  to back to the live video page.



The screenshot shows the IP Camera Configuration web interface. On the left is a sidebar menu with categories: System (containing System Information, User Management, System Update), Network (containing IP Setting, Advanced, PPPoE & DDNS, Server (Mail, Ftp...)), A/V Setting (containing Image Setting, Video Setting, Audio), and Event (containing Event Setting, Schedule, I/O Setting, Log List, SD Card). The main content area is titled 'System Information' and contains the following sections:

- Server Information:**
 - MAC Address: 00:0F:0D:22:57:3A
 - Server Name: IP_Camera ☐ Status Bar
 - Language: ☒ English ☐ 繁體中文 ☐ 简体中文 ☐ French ☐ Russian ☐ Italian ☐ Spanish ☐ German ☐ Portuguese ☐ Polish ☐ Japanese
- OSD Setting:**
 - Time Stamp: ☐ Enabled ☒ Disabled
 - Text: ☐ Enabled ☒ Disabled
 - [OSD Display](#) [Text Edit](#)
- Time Setting:**
 - Server Time: 2012/5/30 11:57:09 Time Zone: GMT+08:00
 - Date Format: ☒ yy/mm/dd ☐ mm/dd/yy ☐ dd/mm/yy
 - Time Zone: GMT+08:00
 - ☐ Enable Daylight Saving:
 - ☐ NTP :
 - NTP Server : 198.123.30.132
 - Update : 6 Hour
 - Time Shift : 0 Minutes [-1440..1440]
 - ☐ Synchronize with PC's time
 - Date : 2012/5/30
 - Time : 11:57:23
 - ☐ Manual
 - Date : 2012/5/30
 - Time : 11:57:10
 - ☒ The date and time remain the same

An 'Apply' button is located at the bottom right of the configuration area.

A. System

1. System Information

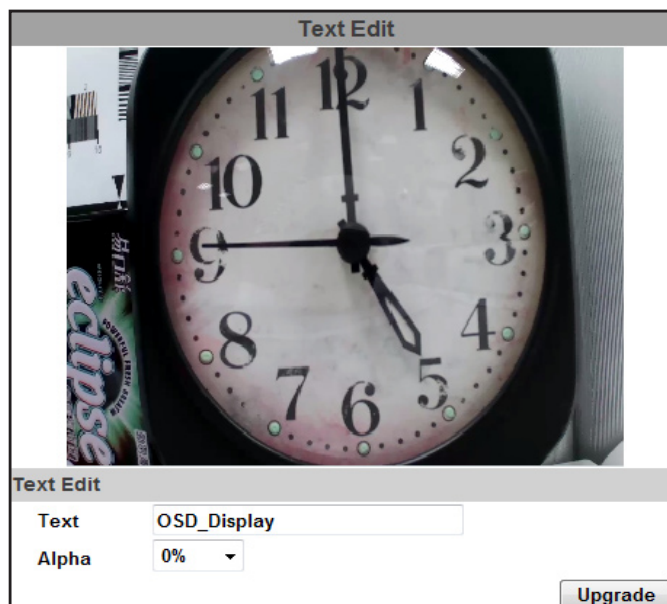
- a. Server Information: Set up the camera name, select language, and set up the camera time.
 - (i) Server Name: This is the Camera name. This name will show on the IP Installer.
 - (ii) Select language: There are 11 languages to choose from. When you change the language, it will show the following dialogue box for confirmation.



- b. OSD Setting: Select a position where date & time stamp / text showing on screen.



Click Text Edit to adjust the OSD text contents. Alpha means background transparency of the text. If you select 100%, the text stamp will be directly displayed on the live screen. If you select 0%, the text stamp will be displayed with a black background.



- c. Server time setting: Select options to set up time - “NTP”, “Synchronize with PC’s time”, “Manual”, “The date and time remain the same”.

Time Setting

Server Time: 2011/11/28 18:48:45 Time Zone: GMT+08:00

Date Format: ☒ yy/mm/dd ☐ mm/dd/yy ☐ dd/mm/yy

Time Zone: GMT+08:00

☒ Enable Daylight Saving:

DST Start:

Month: Mar

Week: 2nd

Day of Week: Sun

Time: 12 am

DST End:

Month: Nov

Week: 1st

Day of Week: Sat

Time: 12 am

☐ NTP :

NTP Server : 198.123.30.132

Update : 6 Hour

Time Shift : 0 Minutes [-1440..1440]

☐ Synchronize with PC's time

Date : 2011/11/28

Time : 18:44:11

☐ Manual

Date : 2011/11/28

Time : 18:43:47

☒ The date and time remain the same

- Server Time: It shows current IPCam server time.
- Date Format: Select the date display format.
- Time Zone: Select your time zone. It affects server time when you use “NTP” time.
- Enable Daylight Saving: Give the start and end daylight saving time. During daylight saving, the time will be 1 hour faster.
- NTP: Key in the NTP server IP address and update interval. The camera time will be synchronized with NTP server time. To use this option, if the NTP Server is under WAN, the camera must be set to access WAN.
- Synchronize with PC’s time: In “Date” and “Time” column it shows your current PC time. Click “Apply” to make the camera time the same with PC time.
- Manual: Key in the date and time, and click “Apply”.
- The date and time remain the same: After you select “Synchronize with PC’s time” or “Manual”, and click “Apply”, the selected mark will jump to this option.

2. User Management

IP CAMERA supports three different users, administrator, general user, and anonymous user.

User Management			
Anonymous User Login			
<input type="radio"/> YES <input checked="" type="radio"/> NO			
Universal Password (differs by IP Address)			
<input type="radio"/> YES <input checked="" type="radio"/> NO Setting			
Add User			
Username: <input type="text"/>			
Password: <input type="text"/>			
Confirm: <input type="text"/>			
Add/Set			
User List			
Username	User Group	Modify	Remove
admin	Administrator	Edit	-----
as	Guest	Edit	Remove

a. Anonymous User Login:

Select "Yes", then anyone access the camera can watch the live video without username and password. However, If you try to enter the configuration page, the camera will ask you to key in the username and password to log in.

Select "No", then username and password are required to access the camera.

b. Universal Password:

Select "Yes", then user is allowed to login this IPCam by universal password. Please refer to "[Universal Password](#)" chapter for the function explanation.

Select "No", then the universal password function is disabled.

c. Add user:

Type the user name and password, then click "Add/Set". The guest user can only browse the live video page and is not allowed to enter the configuration page.

d. Click "Edit" or "Remove" in the user list to modify them. The system will ask you to key in the password in the pop-up window before you edit the user information.

3. System update:

System Update	
Firmware Upgrade	
Firmware Version:	V1.0.0
New Firmware:	<input type="button" value="選擇檔案"/> 未選擇檔案
<input type="button" value="Upgrade"/>	
Reboot System	
<input type="button" value="Start"/>	
Factory Default	
<input type="button" value="Start"/>	
Setting Management	
Save As a File:	Right click the mouse button on <u>Setting Download</u> and then select Save As to save current system's setting in the PC.
New Setting File:	<input type="button" value="選擇檔案"/> 未選擇檔案
<input type="button" value="Upgrade"/>	

- a. To update the firmware online, click “Browse...” to select the firmware. Then click “Upgrade” to proceed.

Note: The firmware upgrade might be accompanied by the changing of some setting and function, and the setting options might become different to the user manual that you're reading now.

- b. Reboot system:re-start the IP camera
- c. Factory default:delete all the settings in this IP camera.
- d. Setting Management:User may download the current setting to PC, or upgrade from previous saved setting.
- (i) Setting download:
Right-click the mouse button on Setting Download → Select “Save AS...” to save current IP CAM setting in PC → Select saving directory → Save
- (ii) Upgrade from previous setting:
Browse → search previous setting → open → upgrade → Setting update confirm → click [index.html](#). to return to main page

B. Network

1. IP Setting

a. IP Assignment

IP Setting	
IP Assignment	
<input type="radio"/> DHCP	
<input checked="" type="radio"/> Static	
IP Address:	192.168.40.150
Subnet Mask:	255.255.255.0
Gateway:	192.168.40.254
DNS 0:	168.95.1.1
DNS 1:	168.95.192.1

IP Camera supports DHCP and static IP.

- (i) DHCP: Using DHCP, IP CAMERA will get all the network parameters automatically.
- (ii) Static IP: Please type in IP address, subnet mask, gateway, and DNS manually.

b. IPv6 Assignment

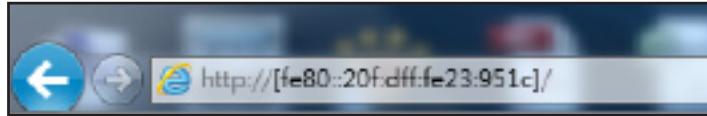
IPv6 Assignment	
<input checked="" type="checkbox"/> IPv6 Enabled:	
<input checked="" type="checkbox"/> Manually setup the IPv6 address:	
IPv6 Address/Prefix:	:: / 64
IPv6 Gateway:	::
IPv6 DNS:	::
DHCPv6:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
IPv6 Address:	fe80::20f:dff:fe00:284d

IPv6 is a newer numbering system that provides a much larger address pool than IPv4, which accounts for most of today's Internet traffic. You can manually key in IPv6 address, enable DHCPv6, and use automatically generated IPv6 address simultaneously.

- (i) Manually setup the IPv6 address: Key in Address, Gateway, and DNS.
- (ii) DHCPv6: If you have a DHCPv6 server, enable it to assign the IPv6 automatically. The assigned IP address will be displayed beside the column.
- (iii) Automatically generated IPv6 Address: Here indicates a virtual IPv6

address generated automatically by IP camera. This virtual IPv6 address cannot use on WAN.

To use IPv6 address to access the IP camera, please open the web browser, and key in [IPv6 address] in address bar. The [] parentheses mark is necessary.



c. Port assignment

Port Assignment	
Web Page Port:	<input type="text" value="80"/>
HTTPS Port:	<input type="text" value="443"/>

HTTPS Setting

(i) Web Page Port: setup web page connecting port and video transmitting port (Default: 80)

(ii) HTTP Port: setup HTTPS connecting port (Default: 443)

d. UPnP (Universal Plug and play)

UPnP	
UPnP:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
UPnP Port Forwarding:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
External Web Port:	<input type="text" value="80"/>
External HTTPS Port:	<input type="text" value="443"/>
External RTSP Port:	<input type="text" value="554"/>

This IP camera supports UPnP, If this service is enabled on your computer, the camera will automatically be detected and a new icon will be added to "My Network Places."

(i) UPnP Port Forwarding:

When the camera is installed under a router, Enable UPnP Port Forwarding to let the router open ports so that the video streams can be sent out from a LAN. Set Web Port, Http Port, and RTSP port, and make sure your router supports UPnP and the function has been activated.

(ii) Note: UPnP must be enabled on your computer. Please follow the procedure to activate UPnP.

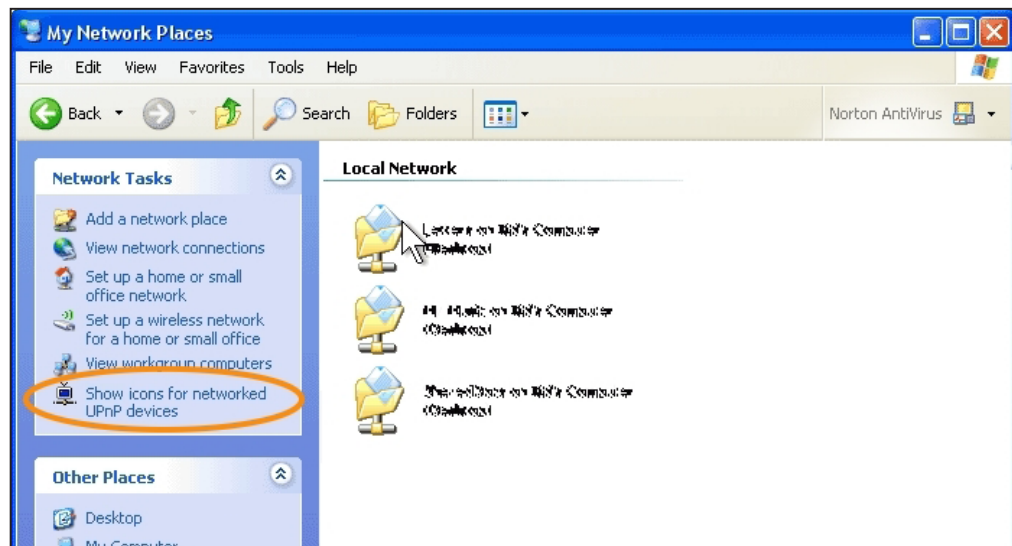
<Approach 1>

- Open the Control Panel from the Start Menu
- Select Add/Remove Programs
- Select Add/Remove Windows Components and open Networking Services section
- Click Details and select UPnP to setup the service

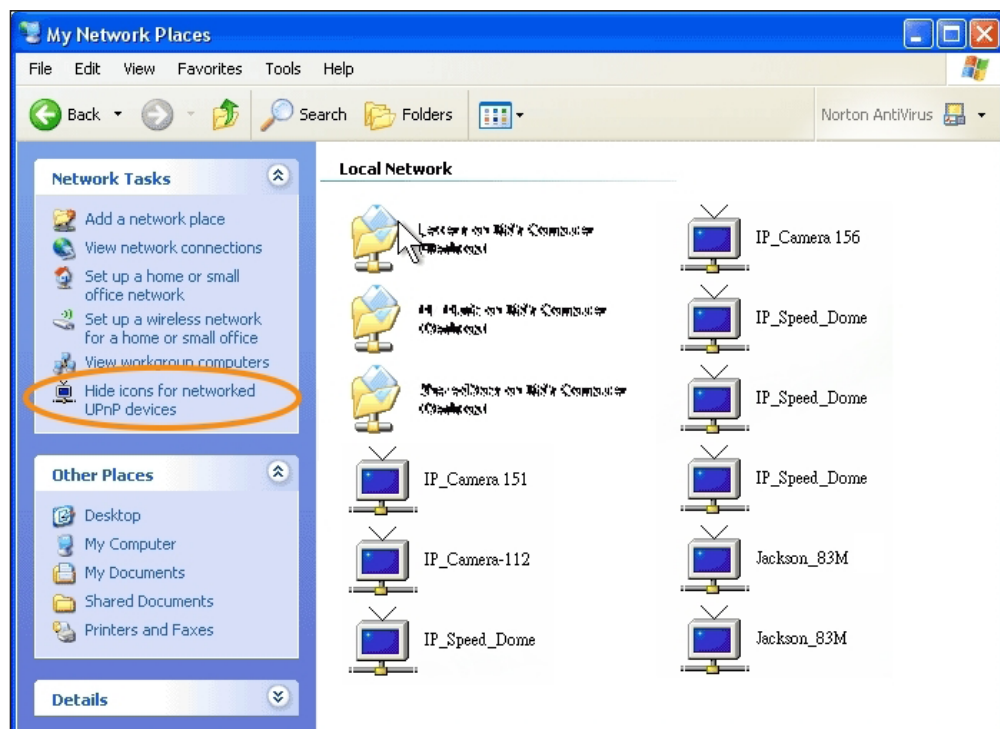
- The IP device icon will be added to "MY Network Places"
- User may double click the IP device icon to access IE browser

<Approach 2>

- Open "My Network Space", and click "Show icons for networked UPnP devices" in the tasks column on the left of the page.
Windows may ask your confirmation for enabling the components.
Click "Yes".



- Now you can see the IP device under the LAN. Double-click the icon to access the camera via web browser. To disable the UPnP, click "Hide icons for networked UPnP devices" in the tasks column.



e. RTSP setting

RTSP Setting		
RTSP Server:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled	
RTSP Authentication:	Disable ▼	
RTSP Port :	554	
RTP Start Port:	5000	[1024..9997]
RTP End port:	9000	[1027..10000]

If you have a media player that supports RTSP protocol, you can use it to receive the video streaming from IP camera. The RTSP address can be set for two streamings respectively. Please jump to Chapter V-C: "[Video Setting](#)". There're setting field for RTSP address of two streamings.

(i) RTSP Server: enable or disable

(ii) RTSP Authentication:

"Disable" means everyone who knows your camera IP Address can link to your camera via RTSP. No username and password are required.

Under "Basic" and "Digest" authentication mode, the camera asks the user to give username and password before allows accessing. The password are transmitted as clear text under basic mode, which provides a lower level of security than under digest mode.

Make sure your media player supports the authentication schemes.

(iii) RTSP Port: setup port for RTSP transmitting (Default: 554)

(iv) RTSP Start and End Port: in RTSP mode, you may use TCP and UDP for connecting. TCP connection uses RTSP Port (554). UDP connection uses RTSP Start and End Port.

f. Multicast Setting (Based on the RTSP Server)

Multicast Setting (Based on the RTSP Server)		
Streaming 1:		
IP Address:	234.5.6.78	[224.3.1.0 ~ 239.255.255.255]
Port:	6000	[1 ~ 65535]
TTL:	15	[1 ~ 255]
Streaming 2:		
IP Address:	234.5.6.79	[224.3.1.0 ~ 239.255.255.255]
Port:	6001	[1 ~ 65535]
TTL:	15	[1 ~ 255]

Multicast is a bandwidth conservation technology. This function allow several user to share the same packet sent from IP camera. To use

Multicast, appoint IP Address and port here. TTL means the life time of packet, The larger the value is, the more user can receive the packet.

To use Multicast, be sure to enable the function "Force Multicast RTP via RTSP" in your media player. Then key in the RTSP path of your camera: "rtsp://(IP address)" to receive the multicast.

g. ONVIF

ONVIF			
ONVIF:	<input checked="" type="radio"/> v2.10/v1.02	<input type="radio"/> v1.01	<input type="radio"/> Disabled
Security:	<input type="radio"/> Enabled	<input checked="" type="radio"/> Disabled	
RTSP Keepalive:	<input checked="" type="radio"/> Enabled	<input type="radio"/> Disabled	

(i) Choose your ONVIF version and settings.

Under ONVIF connection, the video will be transmitted by RTSP. Be sure to enable the RTSP server in IP setting, or you're not able to receive the video via ONVIF.

(ii) Security:

Select "Disable", then the username and password are not required when accessing the camera via ONVIF. Select "Enable", then username and password are necessary.

(iii) RTSP Keepalive:

When the function is enabled, the camera checks once in a while if the user who links to the camera via ONVIF still keeps connecting. If the connection had been broken, the camera stop transmitting video to user.

h. Bonjour

Bonjour	
Bonjour:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Bonjour Name:	IP_Camera @00:0F:0D:00:28:4D

This function enable MAC systems to link to this IP camera. Key in the name here.

The web browser "Safari" also has Bonjour function. Tick "Include Bonjour" in the bookmark setting, and you can see the IP camera appearing under the bonjour category. Click the icon to connect the IP camera.

So far the Bonjour function on Safari browser doesn't support HTTPS protocol. If you select "https" mode for the camera, you can see the camera appearing on Safari's bookmarks but cannot access camera via it.

LLTD (Link Layer Topology Discovery)

LLTD: ☒ Enabled ☐ Disabled

In the computer running Windows Vista or Windows 7, you can find LLTD through the path:

Network map of HUNT_MIS

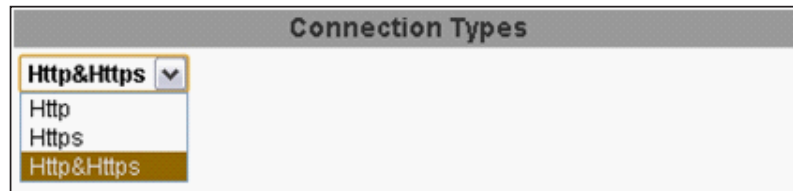
The network map shows a central switch connected to four devices on the left: RD4_TEST2, ns4600-651171, BD_y, and IP_Camera. The central switch is also connected to a gateway, which is connected to the Internet (represented by a globe icon). The gateway is also connected to a second switch, which is connected to a third switch.

```
graph LR; RD4_TEST2 --- S1[Switch]; ns4600-651171 --- S1; BD_y --- S1; IP_Camera --- S1; S1 --- G[Gateway]; G --- I((Internet)); G --- S2[Switch]; S2 --- S3[Switch];
```


2. Advanced

a. Https (Hypertext Transfer Protocol Secure)

When the users access cameras via Https protocol, the transmitted information will be encrypted so that the security level is arisen.

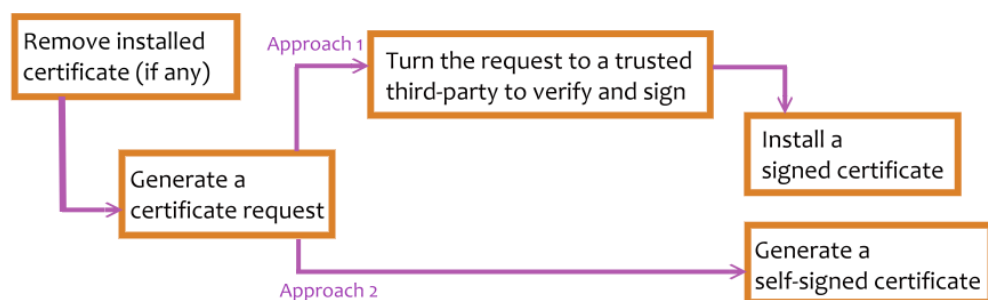


You can select the connection type.

- Http: user can access the camera via Http path but cannot via Https path.
- Https: user can access the camera via Https path but cannot via Http path.
- Http & Https: Both the Http and Https path can be used to access the camera. When you change the setting of connection type, it may cause connection error or disconnection error if you switch the protocol directly. Therefore, Http & Https mode is necessary. If you want to change from Http to Https, please switch to “Http & Https” mode first, and then switch to “Https” mode. Vice versa.

Https protocol has certificate verifying mechanism. When the user access a website via Https, the browser will check the certificate of that domain and verify its trustiness and secure.

Certificate generation process:



- (i) Remove the existing certificate: Before you generate a new certificate, please remove installed one. Select "Http" connection type and click "Remove". If a dialog box pops up to ask you to confirm, click "Yes".

Https Setting

Created Request

Subject: C=TW, ST=, L=, O=, OU=, CN=

Date: 2011/Sep/23 10:04:17

Content Remove

Installed Certificate

Subject: C=TW, ST=, L=, O=, OU=, CN=

Date: Apr 23 09:05:24 2011 GMT

Content Remove

Connection Types

Http

(ii) Created Request: Fill in the following form and click “apply”.

Https Setting

Create Request

Country:

State or province:

Locality:

Organization:

Organizational Unit:

Common Name:

Apply

(iii) After you generate a certificate request, if you choose to turn it to the trusted third-party to verify, please click “Content” and copy all the request content.

Created Request

Subject: C=TW, ST=, L=, O=, OU=, CN=

Date: 2012/Sep/25 08:49:23

Content Remove

Certificate Request:

Data:

Version: 0 (0x0)

Subject: C=TW

Subject Public Key Info:

Public Key Algorithm: rsaEncryption

Public-Key: (1024 bit)

Modulus:

00:b8:cb:17:f7:b6:14:5d:92:99:ae:73:52:7c
09:2a:ad:a6:50:39:5a:3c:09:10:15:85:ad:30
ce:e0:b2:7e:29:3e:d1:e7:15:c4:f2:4f:de:a6
98:f8:71:53:a3:43:0b:2c:1a:20:94:32:76:b3
72:c8:bc:87:35:3f:c7:fc:17:8f:c3:1f:2d:ak
33:3c:9a:28:3b:31:46:d8:c7:26:37:af:fb:5d
aa:b0:a1:75:6a:f9:02:ca:c9:be:49:c9:2a:74
cb:b0:95:1e:63:89:f6:07:6c:cf:1c:5b:38:4e
29:a8:55:82:92:95:bc:74:15

Exponent: 65537 (0x10001)

Attributes:

a0:00

Signature Algorithm: sha1WithRSAEncryption

9b:4c:13:01:ce:10:2a:bc:3c:22:f2:10:e7:48:19:52:98:5e
c9:ae:5a:f4:76:cb:7d:f8:6c:21:e3:a5:9b:45:60:2a:ba:73
23:ce:7a:90:9c:90:b5:a7:41:36:2c:c4:f4:34:55:e5:d0:92
9d:32:d3:e4:2b:d1:04:7c:58:9c:64:4d:38:e3:a6:73:a0:a5

(iv) According to the certificate source, there are two ways to install the

certificate.

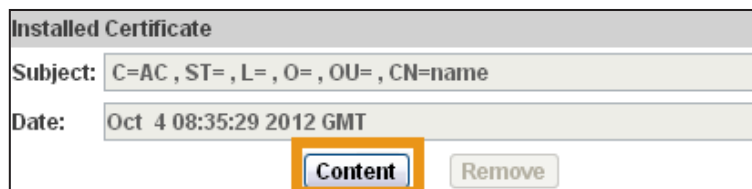
If you had sent the certificate request to do sign and received a signed certificate, please click "browse" and find the certificate file in your computer. Click "Apply" to install it.

If you choose to generate a self-signed certificate, fill in the following forms and set validity day, click "Apply" to finish installed it.



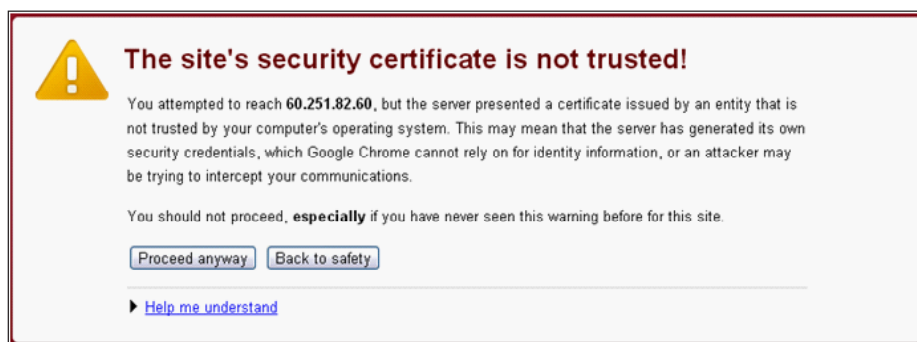
The image shows two stacked windows. The top window is titled "Install Signed Certificate" and has a "Signed Certificate:" label followed by a text box and a "Browse..." button. There is an "Apply" button at the bottom right. The bottom window is titled "Create Self-Signed Certificate" and contains several input fields: "Country:", "State or province:", "Locality:", "Organization:", "Organizational Unit:", "Common Name:", and "Validity:" followed by a "Days" label. There is an "Apply" button at the bottom right.

After finishing installation, you can click "Content" to call out and check the certificate content.



The image shows a window titled "Installed Certificate". It has two rows of information: "Subject: C=AC , ST= , L= , O= , OU= , CN=name" and "Date: Oct 4 08:35:29 2012 GMT". At the bottom, there are two buttons: "Content" (highlighted with an orange box) and "Remove".

- (v) To use Https to access camera, open your browser, and key in "https:// (IP address)/" in the address bar. Now your data will be transmitted via encrypted communications, and the browser will check your certificate status. If it shows you a warning message:



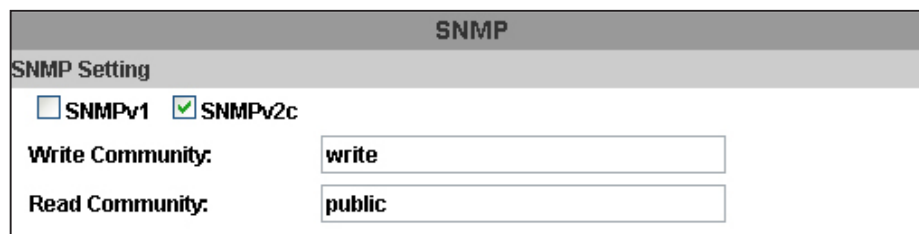
That means your certificate is self-signed or signed by distrusted institution. Click "Proceed anyway" and you can continue going to the camera page.

b. SNMP(Simple Network Management Protocol)

SNMP provides a simple framework for administering networked hardware. To manage the IP camera, you have to prepare a MIB browser or similar tools first. SNMPv1, SNMPv2c, and SNMPv3 can be enabled simultaneously.

The following examples are based on MG-SOFT MIB Browser. Depending on your MIS Browser, you may see different interface and options. Please refer to the user manual of your MIB Browser.

(i) SNMPv1 and SNMPv2:

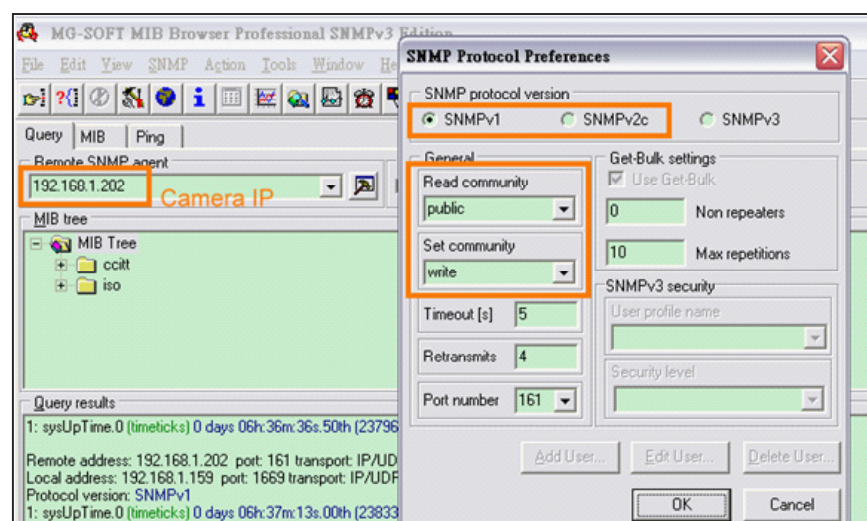


The image shows a dialog box titled "SNMP". Under the "SNMP Setting" section, there are two checkboxes: "SNMPv1" (unchecked) and "SNMPv2c" (checked). Below these, there are two text input fields: "Write Community:" with the value "write" and "Read Community:" with the value "public".

The term "Community name" in SNMPv1 and SNMPv2c can be roughly regarded as key. The person who has the community name has the authority to read or edit the information of IP camera via SNMP.

Tick the box to enable SNMPv1 or SNMPv2c protocol, and specify the community name for write(read and write) and read(read-only). The user who use read community name to access the IP camera cannot modify any data of this camera. The community name can be any English characters and numbers, and must be shorter than 31 bits.

• Example:



The image shows the MG-SOFT MIB Browser Professional SNMPv3 Edition interface. In the "Remote SNMP agent" field, the IP address "192.168.1.202" is entered and highlighted with an orange box, with the label "Camera IP" next to it. The "MIB tree" on the left shows a hierarchy with "MIB Tree", "ccitt", and "iso". The "Query results" at the bottom show a successful query for sysUpTime.0. The "SNMP Protocol Preferences" dialog box is open, showing "SNMPv1" selected under "SNMP protocol version". In the "General" tab, "Read community" is set to "public" and "Set community" is set to "write", both highlighted with orange boxes. Other settings like "Timeout [s]" (5), "Retransmits" (4), and "Port number" (161) are also visible.

Open the MIB Browser. Key in camera IP address(192.168.1.202), select SNMPv1 or SNMPv2, and key in the community name(Key in the

correct Read Community name “public”, the user has read authority to camera; Key in the correct Read Community name “public” and Key in the correct Set community name “write”, the user has write authority to camera.). Connection succeeds.

(ii) SNMPv3:

☒ **SNMPv3**

Write Security Name:

write

Authentication Type:

☒ MD5 ☐ SHA

Authentication Password:

.....

Encryption Type:

☒ DES ☐ AES

Encryption Password:

.....

Read Security Name:

public

Authentication Type:

☒ MD5 ☐ SHA

Authentication Password:

.....

Encryption Type:

☒ DES ☐ AES

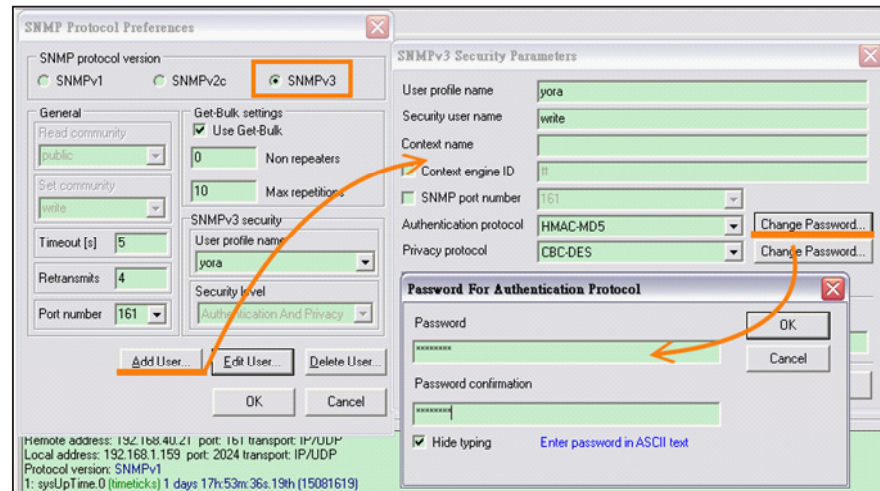
Encryption Password:

.....

For data security reason, the authentication and encryption assurances are added when developing SNMPv3. The user has to give not only the security name(similar with "community name" in v1&v2c) but the password in order to access the IP camera. Please set security name, authentication type, authentication password, encryption type, encryption password of write and read respectively. The security name can be any English characters and numbers, and must be shorter than 31 bits. The password must be 8~64 bits in length.

Different from in SNMPv1 and v2c, the user have to create a account when using SNMPv3. In the account parameters, key in the security name and password you set in the camera to get accessing.

- Example:



Select SNMPv3, add new user, and key in correct security user name(write). Select the same authentication type with camera setting for authentication protocol(MD5), and key in authentication password of write security. Select the same encryption type with camera setting for privacy protocol (DES), and key in encryption password of write security. Click OK to add the user who has write authority to the camera. Connection succeeds.

If you want to add the new user who has read authority, key in correct security user name(public), key in authentication password of read security, and key in encryption password of read security.

(iii) SNMPv1/SNMPv2 Trap:

☒ **SNMPv1A/2c Trap**

Trap Address:

Trap Community:

Trap Event:

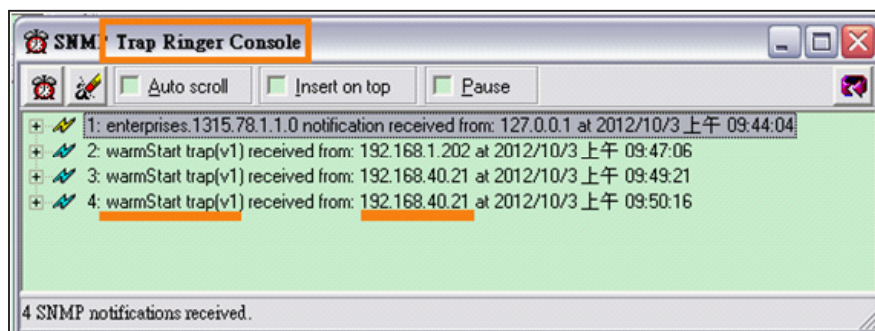
☐ Cold Start
 ☒ Setting Changed
 ☒ Network Disconnected

☐ V3 Authentication Failed
 ☐ SD Insert/Remove

Trap is a mechanism that allows the a managed device to send messages to manager instead of waiting passively for polling from the manager. Specify the trap event. When those events happen, the camera will send the ring message to the Trap Address, which is usually the manager's IP address. Trap Community means the community that can receive the trap message.

Note: Trap Address must be under the same LAN with IP camera.

- Cold Start: The camera starts up or reboots.
 - Setting changed: The SNMP setting is changed.
 - Network Disconnected: The network connection was broken down.
(The camera will send trap messages after the network being connected again)
 - V3 Authentication Failed: A SNMPv3 user account tries to get authentication but failed. (Due to incorrect password or community)
 - SD Insert / Remove: A Micro SD card is inserted or removed.
- Example:



Open the MIB Browser. Use SNMPv1 or SNMPv2 to access the camera. When the SNMP setting is edited, Manager's MIB Browser(192.168.40.159) will receive the trap message of "setting change" from IP Camera (192.168.40.21).

c. Access List

IP FILTER

IP ADDRESS FILTER Setting

☒ Enable ip address filter

IPv4 Setting:

☐ allow
 ☒ deny

range address:
 -

IPv4 List:

No.	IP Address	Filter	Action
1	192.168.50.159	allow	<input type="button" value="remove"/>
2	192.168.50.151-192.168.50.161	deny	<input type="button" value="remove"/>
3			<input type="button" value="remove"/>
4			<input type="button" value="remove"/>
5			<input type="button" value="remove"/>
6			<input type="button" value="remove"/>
7			<input type="button" value="remove"/>
8			<input type="button" value="remove"/>
9			<input type="button" value="remove"/>
10			<input type="button" value="remove"/>

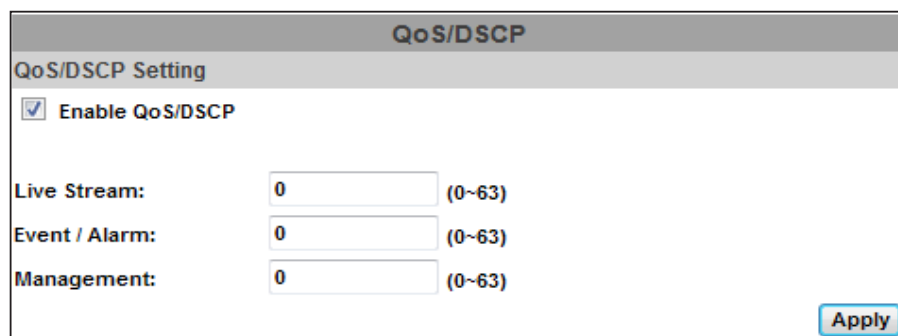
☐ Allow admin ip address always access this device
 Admin ip address:

You can deny an IP address or a range of IP address so that they cannot access the IP camera. Tick the "enable" box, key in the IP address you want to deny, select "deny" then click "Add" to add it to the list.

You can also choose to deny a range of IP address but allow one or several IP address of them. Take the picture above for example, IP address 192.168.50.151~161 are not allowed to connect to the camera, but only 192.168.50.159 can access. Note: In the list "allow" condition must be ranked before "deny" condition. For example, if we exchange the sequence, set "Deny: 192.168.50.151~192.168.50.161" for the first item and "Allow: 192.168.50.159" for the second item in the list, the IP "192.168.50.159" turns out to be denied by the camera because the "deny" condition has the priority according to our ranking way.

As for those IP addresses not included in the list, the default is "allow".

d. QoS/DSCP(Quality of Server/Differentiated Services Code-point)



DSCP specifies a simple mechanism for classifying and managing network traffic and provide QoS on IP networks. DSCP is a 6-bit in the IP header for packet classification purpose.

Set up instruction:

The number 0~63 for Live Stream, Event / Alarm, and Management represent the ratio that the bandwidth is divided. For example, if you set 5, 10, and 20 for the three items, then the bandwidth of the three item is 5:10:20. The item getting more bandwidth has lower probability to be delayed. There is no difference between setting "0, 0, 0" or "63, 63, 63" because under these two setting the three items will get equal bandwidth (1/3).

The three stream control the protocols respectively:

- Live Stream (Video and audio) : RTP / RTSP
- Event/Alarm : FTP / SMTP / SAMBA / SIP
- Management : HTTPS / HTTP / SNMP

Note: The "Management" stream handles both the live view and the setting area of the web page on which the data is transferred via http/https protocol. If you prefer to distribute more bandwidth when using the web browser to watch the live video, please adjust the Management Stream instead of Live Stream.

e. IEEE 802.1x

IEEE 802.1x/EAP-TLS

IEEE 802.1x Setting

☐ Enable IEEE 802.1x

Eapol version:

☒ v1 ☐ v2

Identity:

Private key password:

Apply

CA certificate:

Upload

瀏覽...

Remove

Status:

Client certificate:

Upload

瀏覽...

Remove

Status:

Client private key:

Upload

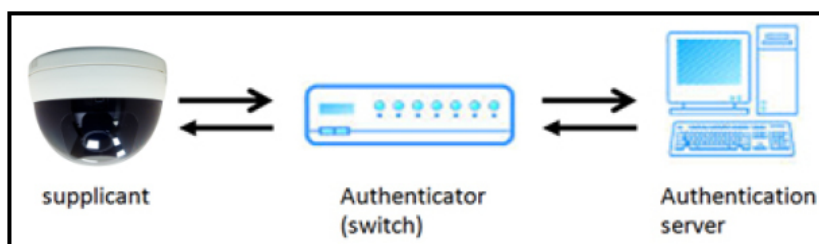
瀏覽...

Remove

Status:

IEEE 802.1x is an IEEE standard for port-based Network Access Control. It provides an authentication mechanism to device wishing to attach to a LAN or WLAN. To use this function, you need a device to build IEEE 802.1x LAN at first.

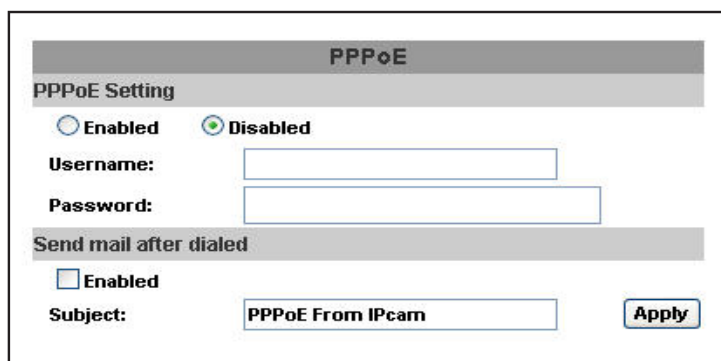
The EAPOL protocol support service identification and optional point to point encryption over the local LAN segment.



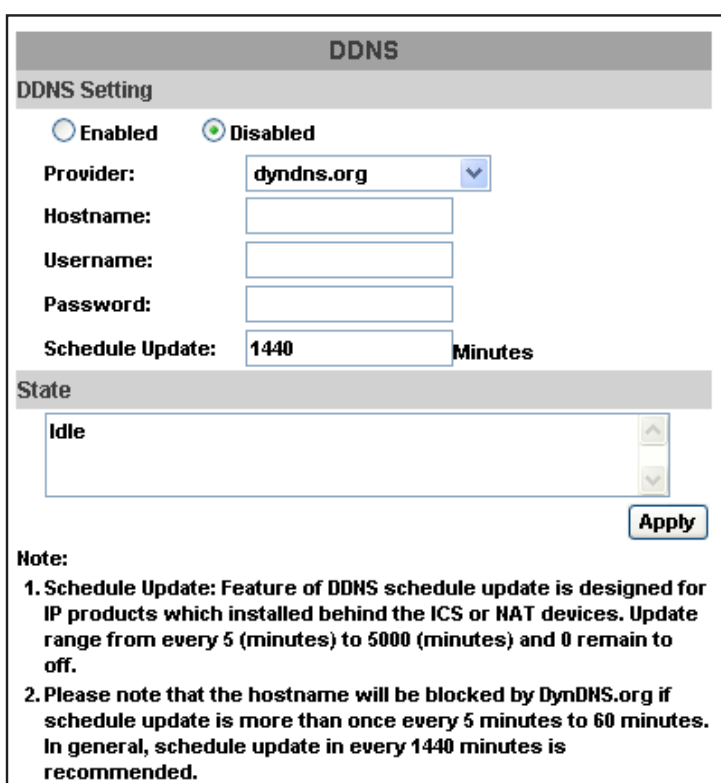
Please check what version of the authenticator and authentication server support. This camera supports EAP-TLS method. Please enter ID, password issued by the CA, then upload related certificates.

3. PPPoE & DDNS

- a. PPPoE: Select “Enabled” to use PPPoE. Key-in Username and password for the ADSL connection. Send mail after dialed: When connect to the internet, it will send a mail to a specific mail account. For the mail setting, please refer to Server settings.



- b. DDNS:



Note:

1. Schedule Update: Feature of DDNS schedule update is designed for IP products which installed behind the ICS or NAT devices. Update range from every 5 (minutes) to 5000 (minutes) and 0 remain to off.
2. Please note that the hostname will be blocked by DynDNS.org if schedule update is more than once every 5 minutes to 60 minutes. In general, schedule update in every 1440 minutes is recommended.

It supports DDNS (Dynamic DNS) service.

- (i) Enable this service
- (ii) Key-in the DynDNS server name, user name, and password.
- (iii) Set up the IP Schedule update refreshing rate.
- (iv) Click “Apply”
- (v) If setting up IP schedule update too frequently, the IP may be blocked.
In general, schedule update every day (1440 minutes) is recommended

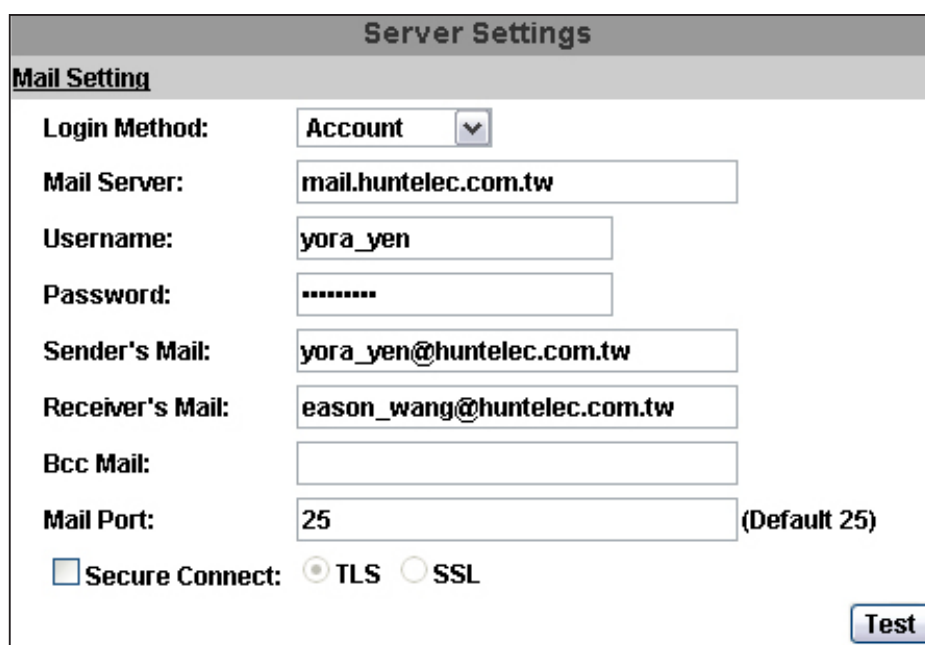
(vi) DDNS Status

- Updating: Information update
- Idle: Stop service
- DDNS registration successful, can now log by <http://<username>.ddns.camddns.com>: Register successfully.
- Update Failed, the name is already registered: The user name has already been used. Please change it.
- Update Failed, please check your internet connection: Network connection failed.
- Update Failed, please check the account information you provide: The server, user name, and password may be wrong.

4. Server setting

The settings of Email, FTP and SAMBA are used when the event happens, schedule snapshot executes, or the alarm input is triggered. Select the item to display the detailed configuration options. You can configure either one or all of them.

a. Mail Setting:

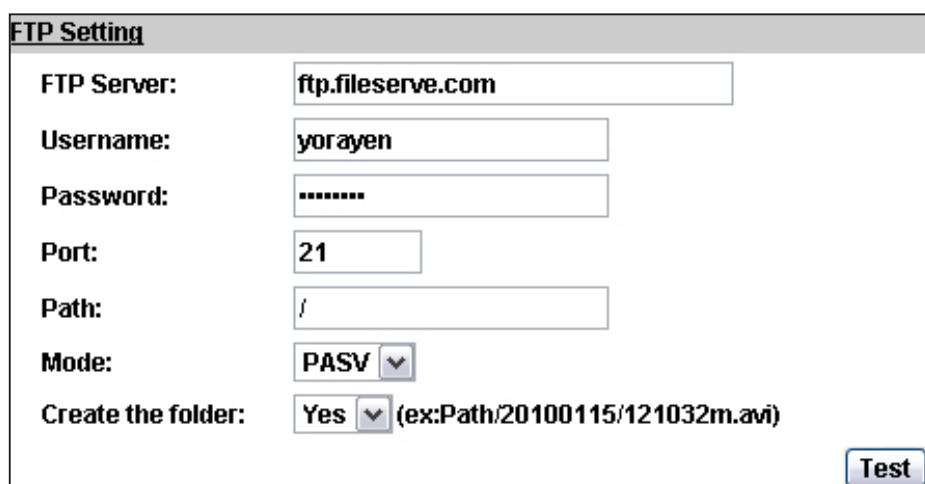


The 'Mail Setting' window is part of the 'Server Settings' section. It contains the following fields and options:

- Login Method:** A dropdown menu set to 'Account'.
- Mail Server:** A text box containing 'mail.huntelec.com.tw'.
- Username:** A text box containing 'yora_yen'.
- Password:** A text box with masked characters '.....'.
- Sender's Mail:** A text box containing 'yora_yen@huntelec.com.tw'.
- Receiver's Mail:** A text box containing 'eason_wang@huntelec.com.tw'.
- Bcc Mail:** An empty text box.
- Mail Port:** A text box containing '25', with '(Default 25)' noted to the right.
- Secure Connect:** A checkbox that is unchecked, followed by radio buttons for 'TLS' (selected) and 'SSL'.
- Test:** A button in the bottom right corner.

Set up the server address and account information of your e-mail. Click "Apply" to save the setting, then use "Test" button to test the server connection. A message box will tell you "OK!" if it works, and a test e-mail will be sent to receiver's mail address.

b. FTP:



The 'FTP Setting' window contains the following fields and options:

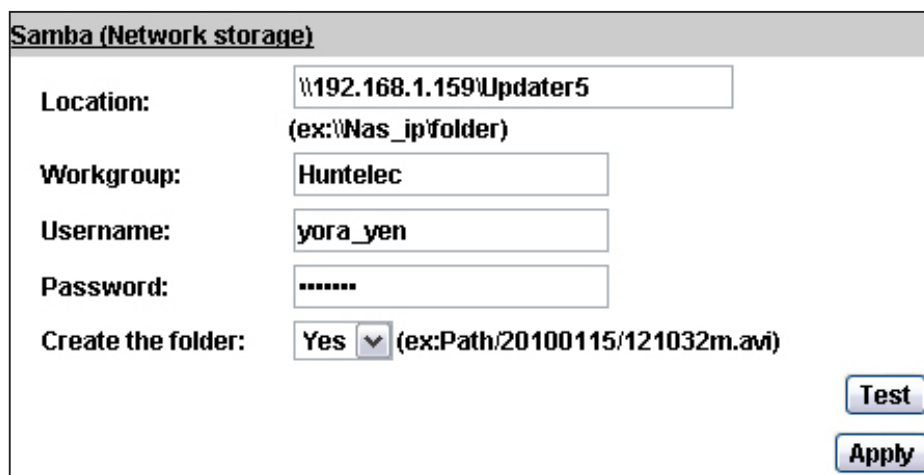
- FTP Server:** A text box containing 'ftp.fileserve.com'.
- Username:** A text box containing 'yorayen'.
- Password:** A text box with masked characters '.....'.
- Port:** A text box containing '21'.
- Path:** A text box containing '/'.
- Mode:** A dropdown menu set to 'PASV'.
- Create the folder:** A dropdown menu set to 'Yes', with '(ex:Path/20100115/121032m.avi)' shown to the right.
- Test:** A button in the bottom right corner.

Set up the server address and account information of your FTP. Click "Apply" to save the setting, then use "Test" button to test the server

connection. A message box will tell you “OK!” if it works, and a test file will be uploaded to FTP space.

In PORT mode, the FTP server builds the connection to the user's data port actively. However, from the user-side firewall's standpoint, the action of connecting from FTP server is often considered to be dangerous and should be blocked. In PASV mode, the problem is solved: The FTP server waits for the data transmission connection built by the user. Make sure that the server supports the mode you select.

c. Samba:



Samba (Network storage)

Location:
(ex: \\Nas_ip\folder)

Workgroup:

Username:

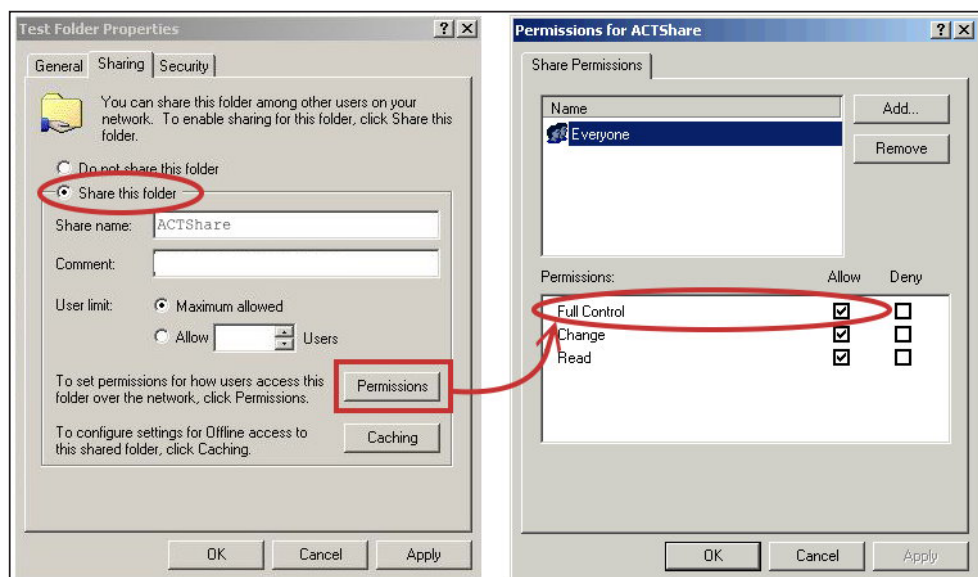
Password:

Create the folder: ☒ (ex: Path/20100115/121032m.avi)

Test **Apply**

Select this option to send the media files via a network neighborhood when an event is triggered. Click “Apply” to save the setting, then use “Test” button to test the server connection. A message box will tell you “OK!” if it works, and a test document will be created in the location.

If the test failed, check the sharing setting of your location folder. The folder properties must be “shared” and the permissions must be “Full Control” as the picture.



Test Folder Properties

General **Sharing** **Security**

You can share this folder among other users on your network. To enable sharing for this folder, click Share this folder.

☐ Do not share this folder

☒ Share this folder

Share name:

Comment:

User limit: ☒ Maximum allowed

☐ Allow Users

To set permissions for how users access this folder over the network, click Permissions.

To configure settings for Offline access to this shared folder, click Caching.

Permissions **Caching**

Permissions for ACTShare

Share Permissions

Name:

Permissions:

	Allow	Deny
Full Control	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Change	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Read	<input checked="" type="checkbox"/>	<input type="checkbox"/>

OK **Cancel** **Apply**

C. A/V Setting

1. Image Setting



For the security and privacy purpose, there are three areas can be setup for privacy mask. Click Area button first and drag an area on the above image, and remember to save your setting. The masked area will not show on both the live view and recording.

Please refer to the details below for Image setting:

- Brightness, Contrast, Hue, Saturation, Sharpness can be adjusted here.
- AGC: Automatic gain control. The sensitivity of camera can adjust with the environmental light. Enable this function and the brighter image can be got

under dim light, but the level of noise may also increase.

c. Shutter Time: Choose as the location of your camera or fixed shutter time. The shorter the shutter time is, the less light the camera receives and the image becomes darker.

d. Sense-Up: This function increases the sensitivity of camera to get brighter image at night. The smaller the value you select, the slower the shutter speed becomes so that the image will get brighter, and moving subjects might be blurred.

Sense-Up option is only enabled when users select "outdoor" or "indoor" in shutter time option.

e. D-WDR: Digital wide dynamic range. This function enables the camera to reduce the contrast in the view to avoid the dark zones resulting from over and under exposure.

f. Video Orientation: Flip or mirror the image as your requirement.

g. Day & Night: The camera can detect the light level of environment. If you select "Light Sensor Mode", the image will be turned to black and white at night in order to keep clear. Appoint a lux standard of switching D/N. The current lux here is for reference. Under "Times Mode" the switch time of Color / Black and white is according to the given time. Under "Synchronize with DI" mode, the image will be turned to black and white when the camera receives triggering from DI. You can also control it by choosing "Color" or "B/W".

h. White Balance: Enhance red / blue color in the image.

i. DNR: Digital noise reduction. This function is able to filter the noise and blur from the image and show a clearer view. Select the DNR extent.

Note: When you select a number in "Shutter Time", actually the shutter time varies in a range and controlled by camera automatically. Following table shows the shutter time option and corresponding range.

Option	Shutter Time Range (sec.)
Outdoor	1/10000 ~ Selected number in "Sense-up"
Indoor	NTSC: 1/125 ~ Selected number in "Sense-up" PAL: 1/100 ~ Selected number in "Sense-up"
1/30	1/10000 ~ 1/30
1/50	1/10000 ~ 1/50
1/60	1/10000 ~ 1/60
1/100	1/10000 ~ 1/100
1/125	1/10000 ~ 1/125
1/250	1/10000 ~ 1/250
1/500	1/10000 ~ 1/500
1/1000	1/10000 ~ 1/1000
* Sense-up options: 1/30, 1/15, 1/10, 1/5	

2. Video Setting

a. Video System Setting:

Choose the input resolution, the option affects the max value of video frame rate.

Choose the Video System, NTSC or PAL.

Video Setting	
Input Resolution:	1280x1024 @ 20fps ▼
Video System:	NTSC ▼

b. Basic Mode of Streaming 1 and Streaming 2:

Streaming 1 Setting	
<input checked="" type="radio"/> Basic Mode <input type="radio"/> Advanced Mode	
Resolution:	1280x1024 ▼
Quality:	Best ▼
Video Frame Rate:	20 FPS ▼
Video Format:	H.264 ▼
RTSP Path:	<input type="text"/> ex:rtsp://IP_Address/ Audio:G.711
Streaming 2 Setting	
<input checked="" type="radio"/> Basic Mode <input type="radio"/> Advanced Mode <input type="radio"/> Close	
Resolution:	640x480 ▼
Quality:	Standard ▼
Video Frame Rate:	20 FPS ▼
Video Format:	JPEG ▼
RTSP Path:	v2 <input type="text"/> ex:rtsp://IP_Address/v2 Audio:G.711

- (i) Resolution: If “1280x1024 @20fps” is selected in Input Resolution option, you can select 1280x1024, 640x480, 320x240, or 176x144 here. If “1280x800 @30fps” is selected in Input Resolution, you can select 1280x800, 1280x720, 640x480, 320x240, or 176x144 here.
- (ii) Quality: The higher the quality is, the bigger the file size is. It might affect Internet transmitting speed if the file gets too large.
- (iii) Video Frame Rate: The video refreshing rate per second. The max value is affected by the input resolution you choose.
- (iv) Video Format: H.264, MPEG4, or M-JPEG
- (v) RTSP Path: Set the RTSP output connecting route.

c. Advanced Mode of Streaming 1 and Streaming 2:

Streaming 1 Setting	
<input type="radio"/> Basic Mode	<input checked="" type="radio"/> Advanced Mode
Resolution:	1280x1024
Bitrate Control Mode:	<input checked="" type="radio"/> CBR <input type="radio"/> VBR
Video Quantitative:	9
Video Bitrate:	3Mbps
Video Frame Rate:	20 FPS
GOP Size:	1 X FPS GOP = 20
Video Format:	H.264
RTSP Path:	ex:rtsp://IP_Address/ Audio:G.711
Streaming 2 Setting	
<input type="radio"/> Basic Mode	<input checked="" type="radio"/> Advanced Mode <input type="radio"/> Close
Resolution:	640x480
Quality:	Standard
Video Frame Rate:	20 FPS
Video Format:	JPEG
RTSP Path:	v2 ex:rtsp://IP_Address/v2 Audio:G.711

- (i) Resolution: If “1280x1024 @20fps” is selected in Input Resolution option, you can select 1280x1024, 640x480, 320x240, or 176x144 here. If “1280x800 @30fps” is selected in Input Resolution, you can select 1280x800, 1280x720, 640x480, 320x240, or 176x144 here.
- (ii) Bitrate Control Mode: In CBR(Constant Bit Rate) mode, the bitrate keeps consistent all over the video. In VBR(Variable Bit Rate) mode, the bitrate changes with the complexity extent of the video data. VBR provides a better compression way and the file may be smaller. However, the VBR file size cannot be predicted. The image may become broken or lagged when your bandwidth is not enough for the data quantity you selected.
- (iii) Video Quantitative: The quality parameter of VBR. You can choose 1~10 compression rate. The higher the value is, the higher the image quality is.
- (iv) Video Bitrate: The quality parameter of CBR. You can choose 32kbps ~10Mbps. The higher the value is, the higher the image quality is.
- (v) Video Frame Rate: The video refreshing rate per second. The max value is affected by the input resolution you choose.
- (vi) GOP Size: It means “Group of Pictures”. The higher the GOP is, the better the quality is.
- (vii) Video Format: H.264, MPEG4, or M-JPEG
- (viii) RTSP Path: RTSP output connecting route.

d. 3GPP Streaming mode:

3GPP Streaming Setting	
<input type="radio"/> Enabled	<input checked="" type="radio"/> Disabled (Resolution=176x144, FPS=5, Format=MPEG4)
3GPP Path:	<input type="text" value="3g"/> ex:rtsp://IP_Address/3g Audio:AMR ex:rtsp://IP_Address/3gx No Audio

To receive video via 3gpp, please remember to enable rtsp server in the "IP Setting" page.

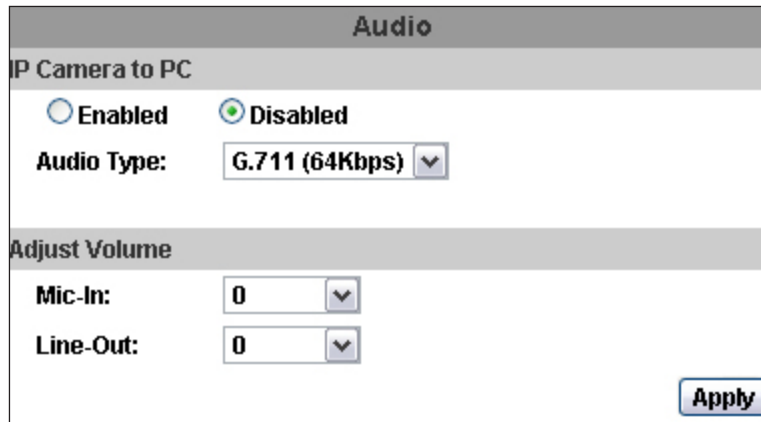
3GPP mode fixed setting: 176x144 resolution, 5FPS, Video compression: MPEG4, Audio compression: AMR.

- (i) Enable or Disable 3GPP Streaming
- (ii) 3GPP Path: 3GPP output connecting route. If the IP address of your camera is 192.168.40.150, and you key in "3g" in the column, the 3GPP path will be rtsp://192.168.40.150/3g.

3. Audio:

IP Camera supports 2-way audio. Audio can be received by the mic connected with the IP camera and transmitted to remote PC. User can also send audio from remote PC mic to IP Camera's external speaker.

a. IP Camera to PC

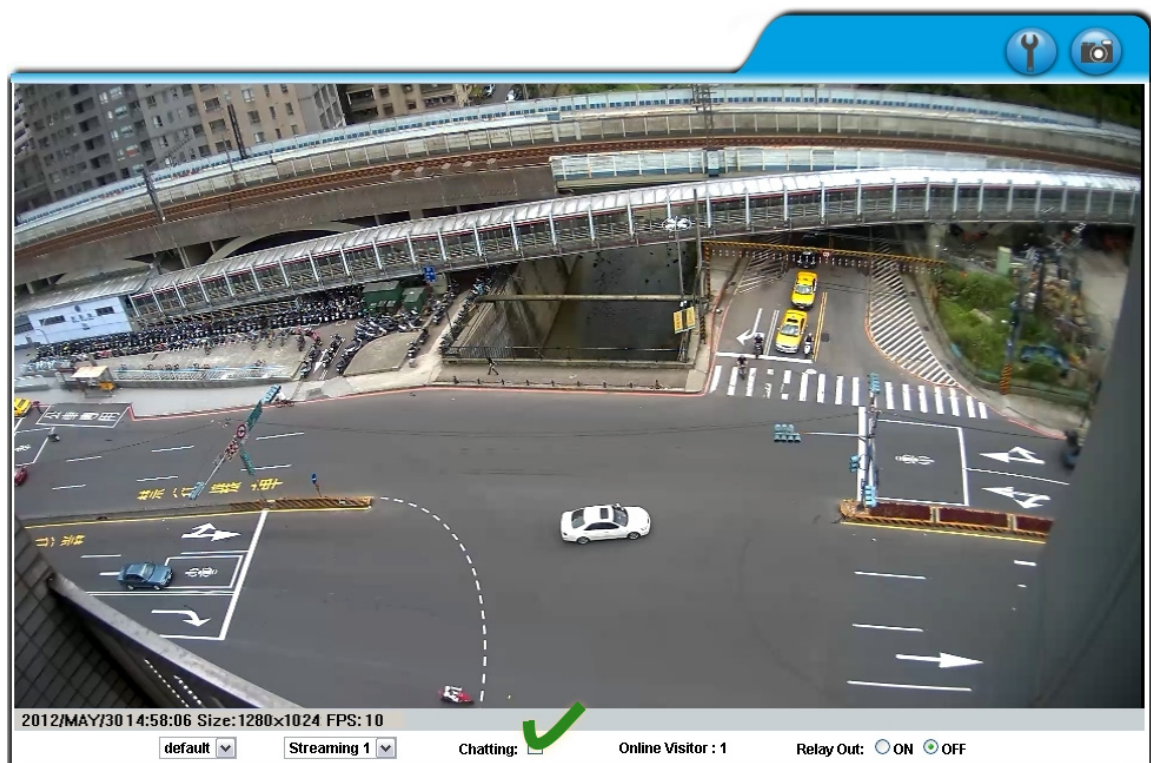


The screenshot shows the 'Audio' configuration window. Under the 'IP Camera to PC' section, the 'Enabled' radio button is selected, and the 'Audio Type' is set to 'G.711 (64Kbps)'. In the 'Adjust Volume' section, both 'Mic-In' and 'Line-Out' volume sliders are set to 0. An 'Apply' button is located at the bottom right.

To receive Audio from IP camera, select "Enable" to start this function. The Audio compression format can be chosen from 3 options. You can also adjust the volume of 2-way audio.

b. PC to IP Camera

Tick "chatting" box in the browsing page, then your voice can be propagated from PC to camera.



If "Chatting" and "Save to SD card" are enabled simultaneously, the sound quality might be affected and becomes not smooth.

D. Event List


IP Camera provides multiple event settings.

1. Event Setting

a. Motion Detection

Event Setting

Motion Detection



Area Setting:

Sensitivity:
☒ Area 1:
☐ Area 2:
☐ Area 3:
Log :
Subject:
Interval:

Area 1	Area 2	Area 3
5	5	5
<input type="checkbox"/> E-mail <input type="checkbox"/> FTP <input type="checkbox"/> Out1 <input checked="" type="checkbox"/> Save to SD card <input type="checkbox"/> Samba	<input type="checkbox"/> E-mail <input type="checkbox"/> FTP <input type="checkbox"/> Out1 <input type="checkbox"/> Save to SD card <input type="checkbox"/> Samba	<input type="checkbox"/> E-mail <input type="checkbox"/> FTP <input type="checkbox"/> Out1 <input type="checkbox"/> Save to SD card <input type="checkbox"/> Samba
<input checked="" type="checkbox"/> E-mail <input type="checkbox"/> FTP <input type="checkbox"/> Samba		
IP Camera Warning!		
10 sec a period of time between every two motions detected.		

To enable motion detection, please tick "Area 1/2/3". Click "Area 1/2/3" in Area Setting, and draw an area on the preview screen. When motion in the area is detected, "Motion!" word will be marked on the live screen, and the camera can send video or snapshot to specific mail addresses, trigger the output device, or save video to FTP/ Micro SD card/ Samba.

If you select "save to SD card", the video or snapshot will be saved to Micro SD card. If you also tick E-mail/ FTP/ Samba of "Log" option, the motion detection log will be sent to E-mail/ FTP/ Samba simultaneously.

- Interval:

For example, if you select "10 sec" here, once the motion is detected and action is triggered, it cannot be triggered again within 10 seconds.

- Based on the schedule:

When the option box is ticked, only during the selected schedule time the motion detection is enabled. That is, for example, the 11th hour of

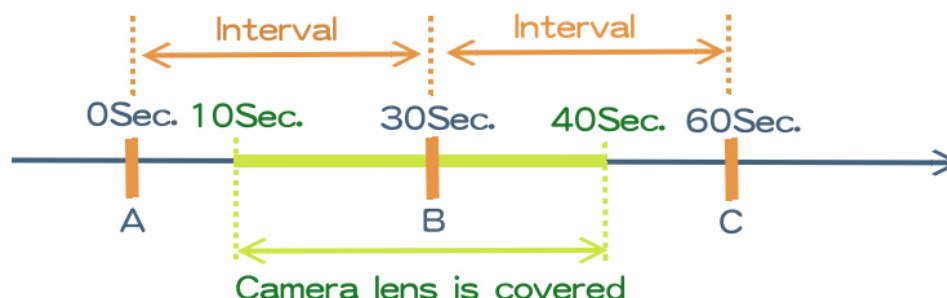
Monday has not been colored in the schedule table, then no action will be triggered even the camera detects motion during 11:00~12:00 on Monday.

b. Tampering Detection

Tampering Detection	
Tampering:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
	<input type="checkbox"/> E-mail <input type="checkbox"/> FTP <input type="checkbox"/> Out1 <input type="checkbox"/> Save to SD card <input type="checkbox"/> Samba
Interval:	<input type="text" value="30 sec"/>

When the camera view is covered, moved, shot by strong light, or out of focus, the tampering detection will be triggered, and send snapshot or video to mail/FTP/Samba/SD card, or trigger the external alarm. Please select the alarm action.

- Interval: The tampering detecting interval. Take the diagram for example, we set interval as 30 second, and the camera lens is covered during 10-40 sec. At timepoint B, the camera compare the view with timepoint A, and send alarm when it found that the lens is covered. At timepoint C, the camera compare the view with timepoint B, and send alarm when it found that the lens is uncovered.



c. Record File

Record File	
File Format:	<input type="text" value="AVI File(with Record Time Setting)"/>

When a event happens, the IP camera can record a video clip or take snapshot, and then send to mail/ FTP/ Samba. Select what format you want to save.

- AVI File (with Record Time Setting): Save AVI video file. The video length is according to the value you set in Record Time Setting.
- JPEG File (Single File with Interval Setting): Save single JPEG picture file when event happens.
- JPEG Files (with Record Time Setting): Only when you select "JPEG" in

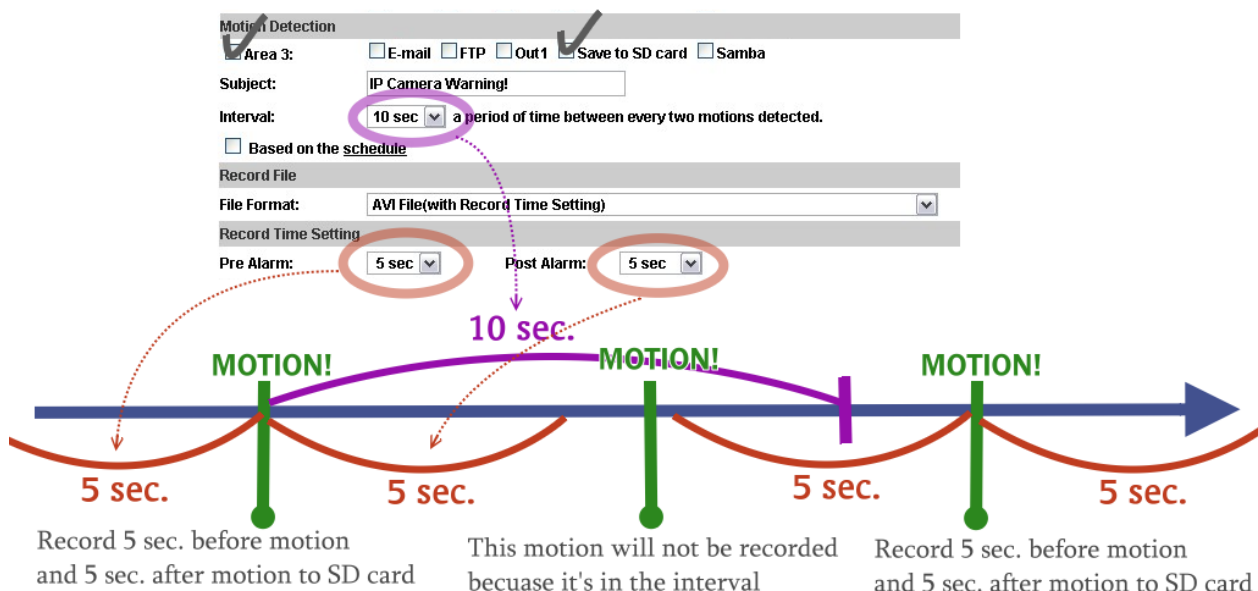
streaming 1 video format of Video Setting, this option can be enabled.
Select this option to save several JPEG picture files, and the successive picture files cover a period of time according to the value you set in Record Time Setting.

d. Record Time Setting

Record Time Setting	
Pre Alarm:	5 sec
Post Alarm:	5 sec

When a event happens, the IP camera can record a video clip or take snapshot, and then send to mail/ FTP/ Samba. Select the video recording length before and after event happens.

- Diagram example of "Interval" and "Pre/ Post Alarm":



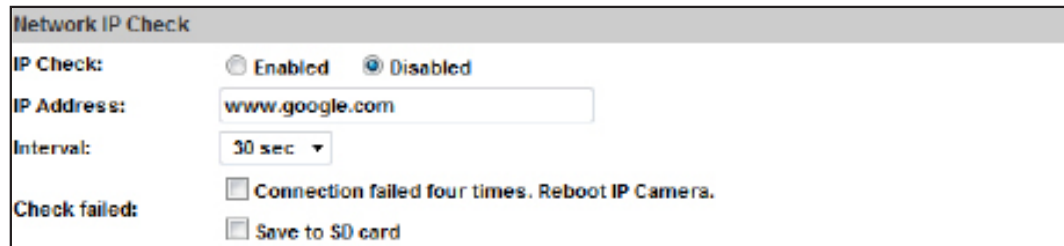
e. Network Dis-connected

Network Dis-connected	
Dis-connected:	<input type="checkbox"/> Save to SD card

To avoid video loss, the camera will start to save the video to local Micro SD card when it detect Ethernet cable is unplugged. The video recording will continuously be saved into Micro SD card and divided into every 5 minutes a file until the network is reconnected successfully. The oldest file will be deleted if the capacity of Micro SD card is full.

This function is only enabled under wire connection.

f. Network IP check




The screenshot shows a configuration window titled "Network IP Check". It contains the following settings:

- IP Check:** Two radio buttons, "Enabled" and "Disabled". The "Disabled" button is selected.
- IP Address:** A text input field containing "www.google.com".
- Interval:** A dropdown menu showing "30 sec".
- Check failed:** Two checkboxes:
 - ☐ Connection failed four times. Reboot IP Camera.
 - ☐ Save to SD card

The same with "Network Dis-connected" function, Network IP check is designed for avoiding video loss. Even when the Ethernet cable is plugged, the network might be sometimes not stable. Key in the target IP address and interval. The camera checks once in a while according to the setting interval time that if itself can access the target IP address. If PIN failed, the camera can start saving the video to Micro SD card. If PIN failed four time successively, the camera can reboot itself.

2. Schedule

Schedule																								
All	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Mon.																								
Tue.																								
Wed.																								
Thu.																								
Fri.																								
Sat.																								
Sun.																								

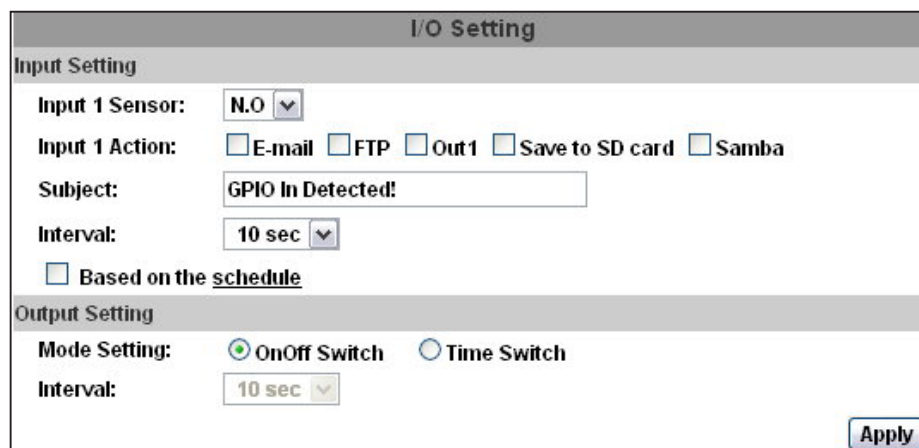
 With schedule setup.

Snapshot	
<input type="radio"/> Enabled	<input checked="" type="radio"/> Disabled
Snapshot:	<input type="checkbox"/> E-mail <input type="checkbox"/> FTP <input type="checkbox"/> Save to SD card <input type="checkbox"/> Samba
Interval:	<input type="text" value="10"/> Second(s) [1..50000]
File Name:	<input type="text" value="Snapshot"/>

Apply

- Schedule: After complete the schedule setup, the camera data will be recorded according to the schedule setup.
- Snapshot: After enable the snapshot function, user can select the storage position of snapshot file, the interval time of snapshot and the reserved file name of snapshot.
- Interval: The interval between two snapshots.

3. I/O Setting



a. Input Setting:

IP Camera supports input and output. When the input condition is triggered, it can trigger the relay out, send the video to mail addresses /FTP server / SAMBA.

- Interval:

For example, if you select "10 sec" here, once the input alarm is detected and action is triggered, it cannot be triggered again within 10 seconds.

- Based on the schedule:

When the option box is ticked, only during the selected schedule time the I/O is enabled. That is, for example, the 11th hour of Monday has not been colored in the schedule table, then no action will be triggered even the camera detects input signal during 11:00~12:00 on Monday.

b. Output Setting:

The output mode affect the DO or relay out duration.

- OnOff Switch:** The camera triggers the external devise and lasts for certain of time according to the event "interval" setting. If it's triggered by motion detection, the triggering time is according to "interval" setting of motion detection. If it's triggered by external input alarm, the triggering time is according to input "interval" setting. It triggers the external devise and lasts for 10 seconds if you select "10" in interval setting. You can turn off the alarm manually by click "off" at the right bottom of the live video page.
- Time Switch:** The camera triggers the external devise and lasts for certain of time according to the output "interval" setting, and the user is not allowed to break off the alarm manually.

4. Log List

Log List	
System Logs	Logs
Motion Detection Logs	Logs
I/O Logs	Logs
All Logs	Logs

Sort by System Logs, Motion Detection Logs and I/O Logs. In addition, System Logs and I/O Logs won't lose data due to power failure.

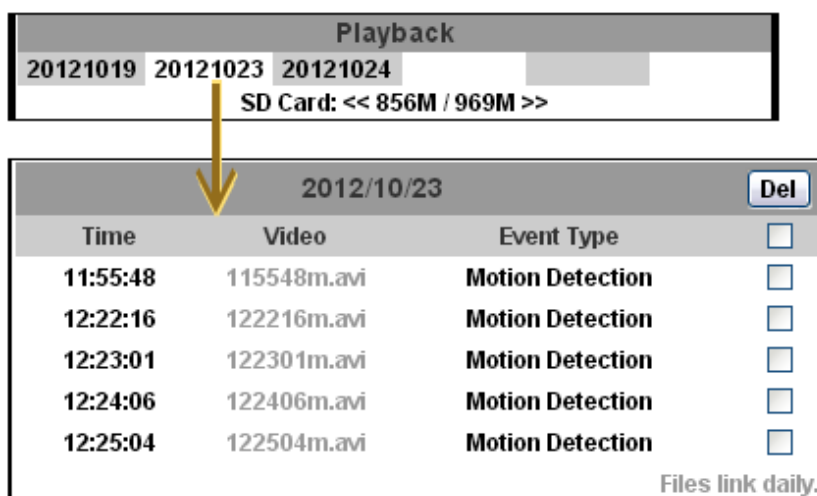
System Log
[2012/07/03 16:22:39] 192.168.40.159 login by admin.
[2012/07/03 11:54:22] 192.168.40.132 login by admin.
[2012/07/02 19:08:52] 192.168.40.132 login by admin.
[2012/07/02 18:24:50] 192.168.40.132 login by admin.
[2012/07/02 14:37:05] 192.168.40.132 login by admin.
[2012/07/02 14:18:26] 192.168.40.132 login by admin.
[2012/07/02 09:00:25] 192.168.40.132 login by admin.
[2012/06/29 19:51:34] Streaming 2 going to Close.
[2012/06/29 19:51:34] Streaming 1 Video bitrate going to 5000 Kbps.

5. SD card

a. Playback

Please Insert Micro SD card before use it. Make sure pushing Micro SD card into the slot completely.

Click the date listed on this page, and it shows the list of the video. The video format is AVI. Click the video to start Microsoft Media Player to play it. To delete the video, check it, then click "Del".



Playback

20121019 20121023 20121024

SD Card: << 856M / 969M >>

2012/10/23				Del
Time	Video	Event Type		
11:55:48	115548m.avi	Motion Detection	<input type="checkbox"/>	
12:22:16	122216m.avi	Motion Detection	<input type="checkbox"/>	
12:23:01	122301m.avi	Motion Detection	<input type="checkbox"/>	
12:24:06	122406m.avi	Motion Detection	<input type="checkbox"/>	
12:25:04	122504m.avi	Motion Detection	<input type="checkbox"/>	

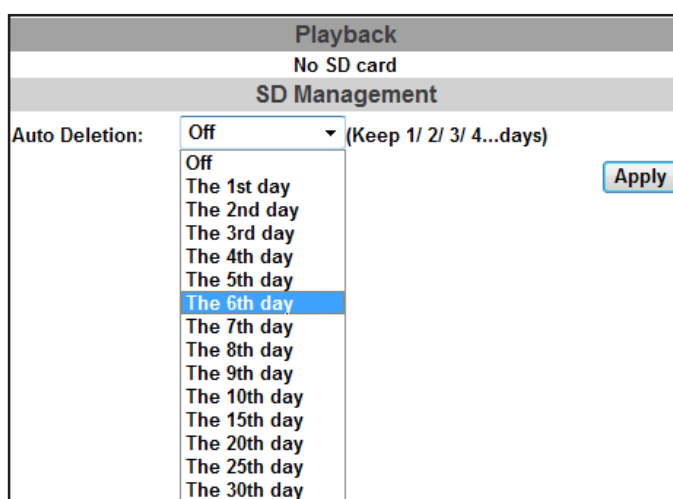
Files link daily.

b. SD Management

"Auto Deletion" means the recording files will be deleted after several days as you selected.

Example: If "The 2st day" is selected, then the recording file at 2012/11/21 5:00AM will be deleted from SD card at 2012/11/23 5:00AM. That is, if the user check the SD card at 2012/11/21 5:00AM, he can only find the recording files between 2012/11/19 5:00AM ~ 2012/11/21 5:00AM.

The oldest file will be deleted if the SD card is full.



Playback

No SD card

SD Management

Auto Deletion: Off (Keep 1/ 2/ 3/ 4...days)

- Off
- The 1st day
- The 2nd day
- The 3rd day
- The 4th day
- The 5th day
- The 6th day**
- The 7th day
- The 8th day
- The 9th day
- The 10th day
- The 15th day
- The 20th day
- The 25th day
- The 30th day

Apply

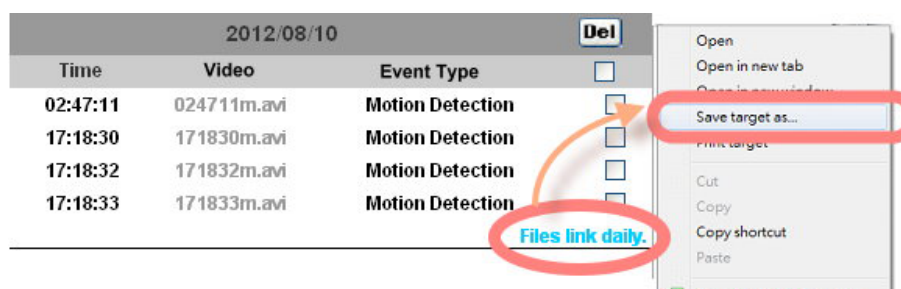
Note : The use of the SD card will affect the operation of the IP Camera slightly, such as affecting the frame rate of the video.

c. Copy to PC

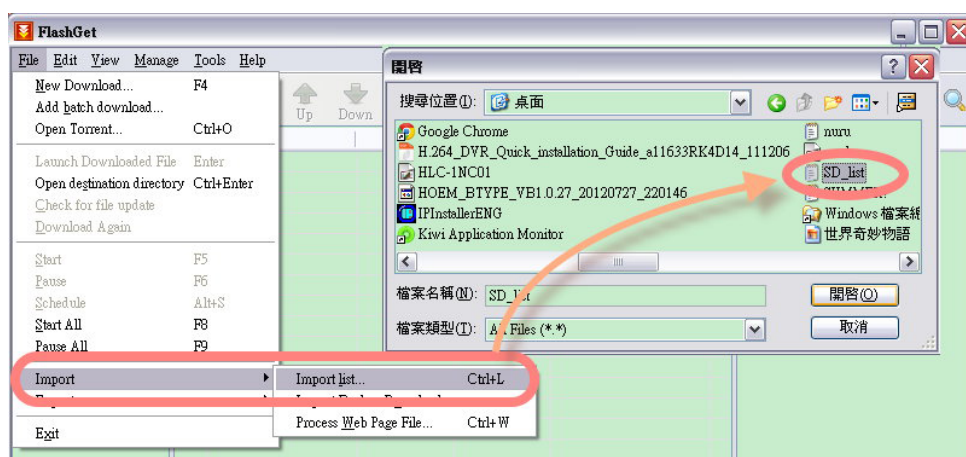
You can insert the Micro SD card to PC and read the files directly, or use FlashGet instead to download the files from IP camera. (In this way you do not need to pull out Micro SD card from the camera.)

To use FlashGet for downloading the image and video data from the Micro SD card, please follow the steps:

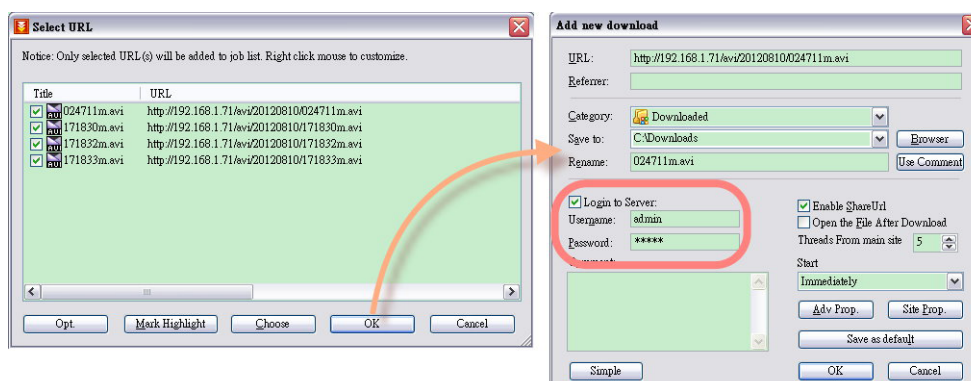
- (i) Enter the data list and right-click "Files link daily", select "save target as..." to save the link list to PC.



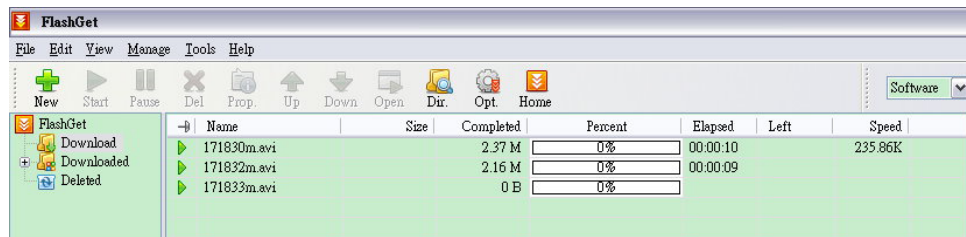
- (ii) Open FlashGet, select "File" → "Import" → "Import list", and find the link list file you just saved. The file name may be called "SD_list".



- (iii) FlashGet will show you the link list, and you can tick the files you want to copy to your PC. Give the directory path in the new download window, and remember to enable "Login to Server": key in the IP Camera username and password.



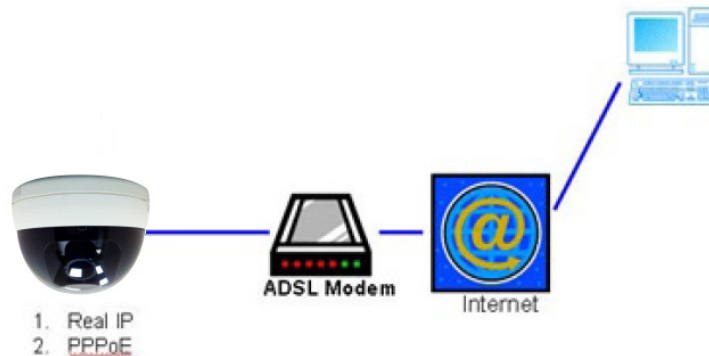
(iv) Click OK to start download.



- FlashGet is a free software that can be downloaded from FlashGet official website. The example above is based on FlashGet ver.1.9.6.

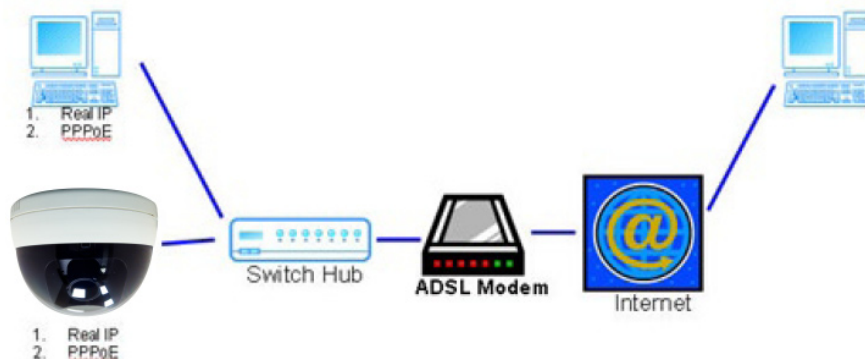
VI. Network Configuration

- Configuration 1:



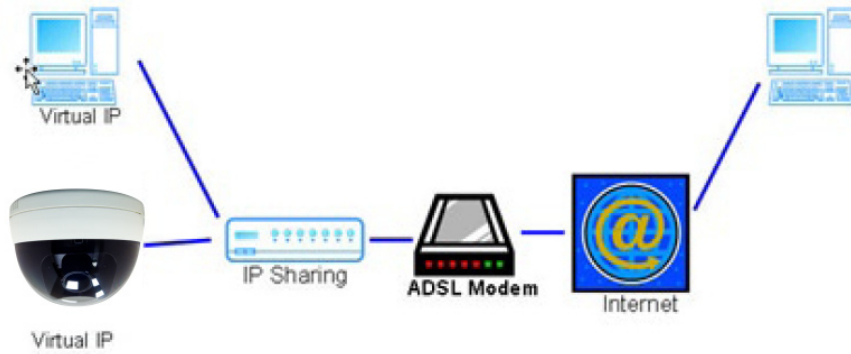
- a. Internet Access: ADSL or Cable Modem
- b. IP address: One real IP or one dynamic IP
- c. Only IP Camera connects to the internet
- d. For fixed real IP, set up the IP into IP Camera. For dynamic IP, start PPPoE.

- Configuration 2:



- a. Internet AccessL: ADSL or Cable Modem
- b. IP address: More than one real IP or one dynamic IP
- c. IP Camera and PC connect to the internet
- d. Device needed: Switch Hub
- e. For fixed real IP, set up the IP into IP Camera and PC. For dynamic IP, start PPPoE.

- Configuration 3:



- Internet Access: ADSL or Cable Modem
- IP address: one real IP or one dynamic IP
- IP Camera and PC connect to the internet
- Device needed: IP sharing
- Use virtual IP, set up port forwarding in IP sharing.

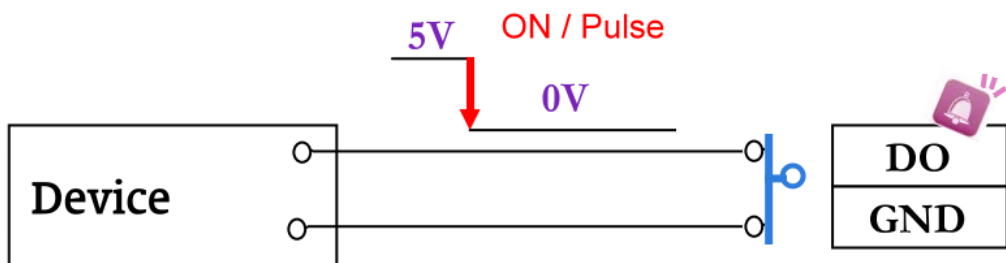
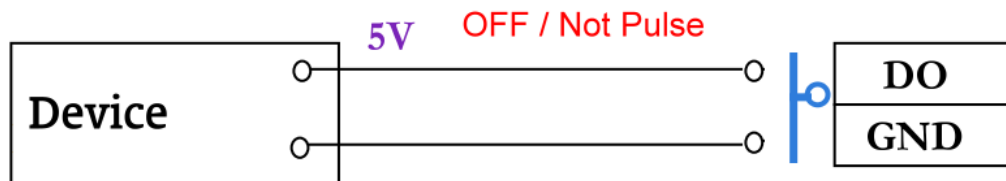
VII. I/O Configuration

1. I/O Connection

- Please connect the GND & DO pin to the external relay (buzzer) device.
- Please connect the GND & DI pin to the external trigger device.



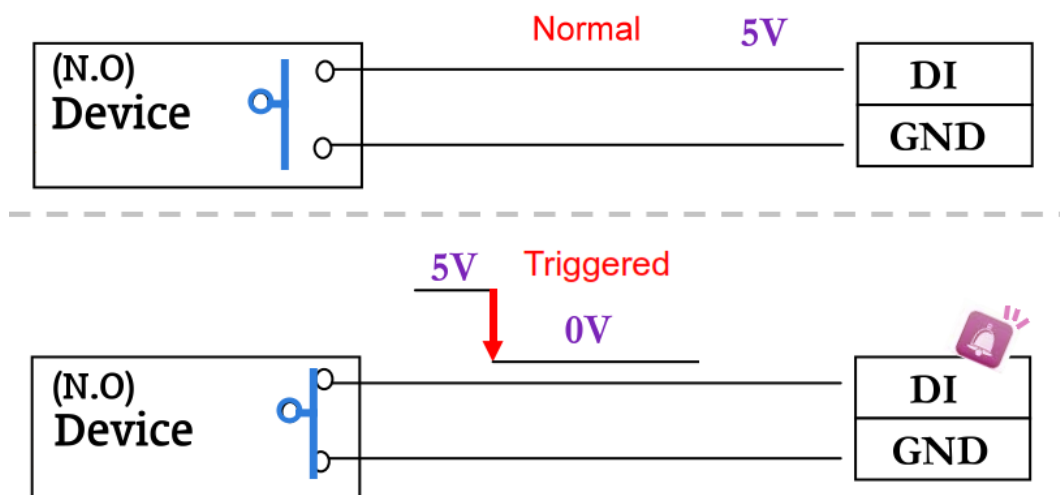
When no event happens, DO output is 5V (DO and GND are disconnected).
When the camera detects event happening and triggers external alarm, DO output is 0V (DO and GND are connected).



If you select "N.O" in "Input sensor setting", when external device or circuit makes DI and GND pin connected, the camera input alarm is triggered, and then camera will execute the action user has set, for example, send snapshot to E-mail address.

If you select "N.C" in "Input sensor setting", when external device or circuit makes DI and GND pin disconnected, the camera input alarm is triggered,

and then camera will execute the action user has set, for example, send snapshot to E-mail address.

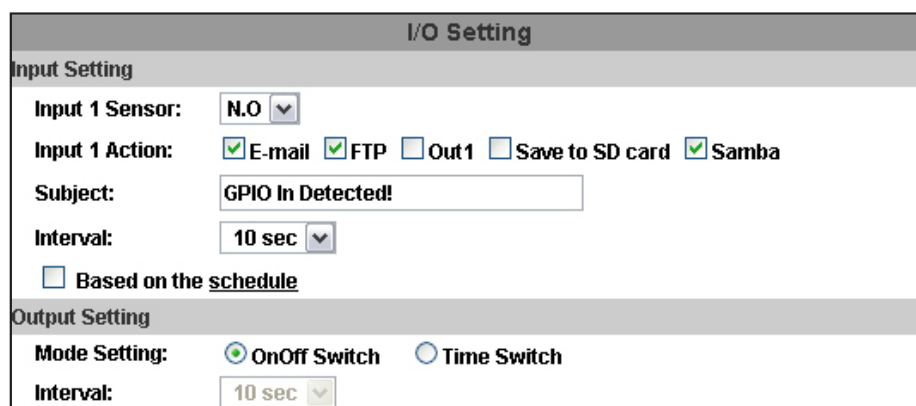


c. I/O PIN definition

- GND (Ground): Initial state is LOW
- DO (Digital Output): DC 5V
- DI (Digital Input): Max. 50mA, DC 5V

2. I/O Setup

- Click I/O Setting from the system setup page via IE, and check "Out1" to enable I/O signal.



The screenshot shows the "I/O Setting" web interface. It is divided into two main sections: "Input Setting" and "Output Setting".

Input Setting:

- Input 1 Sensor:** A dropdown menu set to "N.O".
- Input 1 Action:** A row of checkboxes: ☒ E-mail, ☒ FTP, ☐ Out1, ☐ Save to SD card, and ☒ Samba.
- Subject:** A text input field containing "GPIO In Detected!".
- Interval:** A dropdown menu set to "10 sec".
- ☐ Based on the schedule

Output Setting:

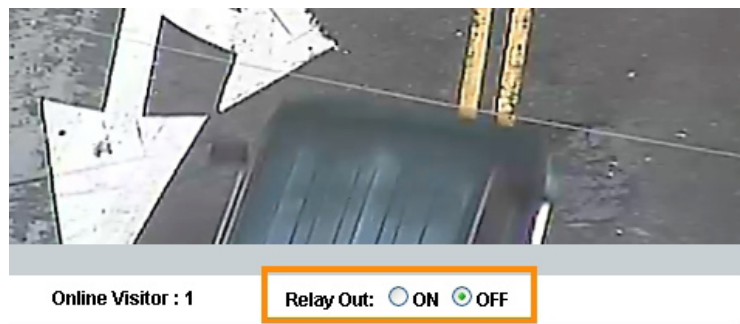
- Mode Setting:** Two radio buttons: ☒ OnOff Switch and ☐ Time Switch.
- Interval:** A dropdown menu set to "10 sec".

b. Output Test

After the external input and output hardware is installed, you can use the "Relay Out" bottom on the live video page to test if DO / Relay Out works.

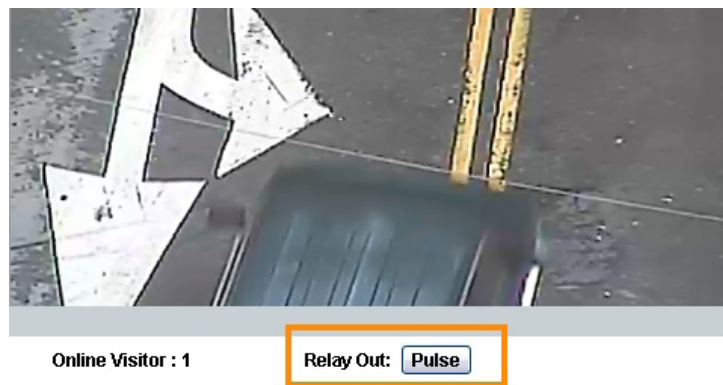
(i) OnOff Switch mode:

Click "ON", the camera will trigger the external output device. For example, your alarm buzzer will continuously ring. You can manually break off the output signal by clicking "OFF".



(ii) Time Switch mode:

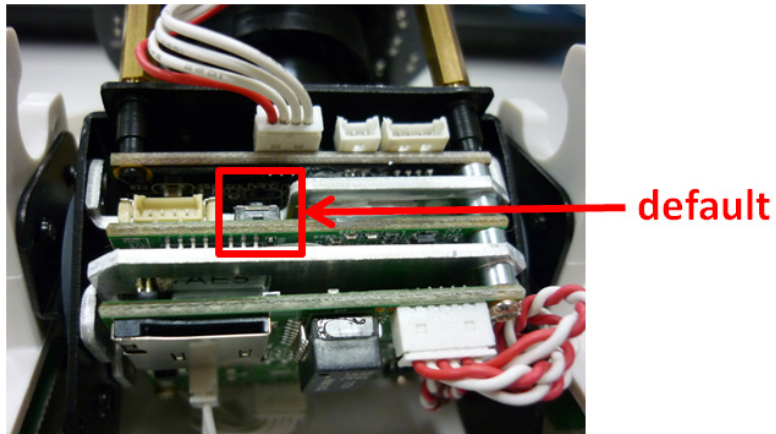
Click "Pulse", the camera will trigger the external output device for several seconds, The duration length is according to the "interval" setting in Output Setting.



VIII. Factory Default

If you forget your password, please follow the steps to revert back to default value.

- Remove the power adapter and the ethernet cable. Press and hold the button in the IP CAMERA.



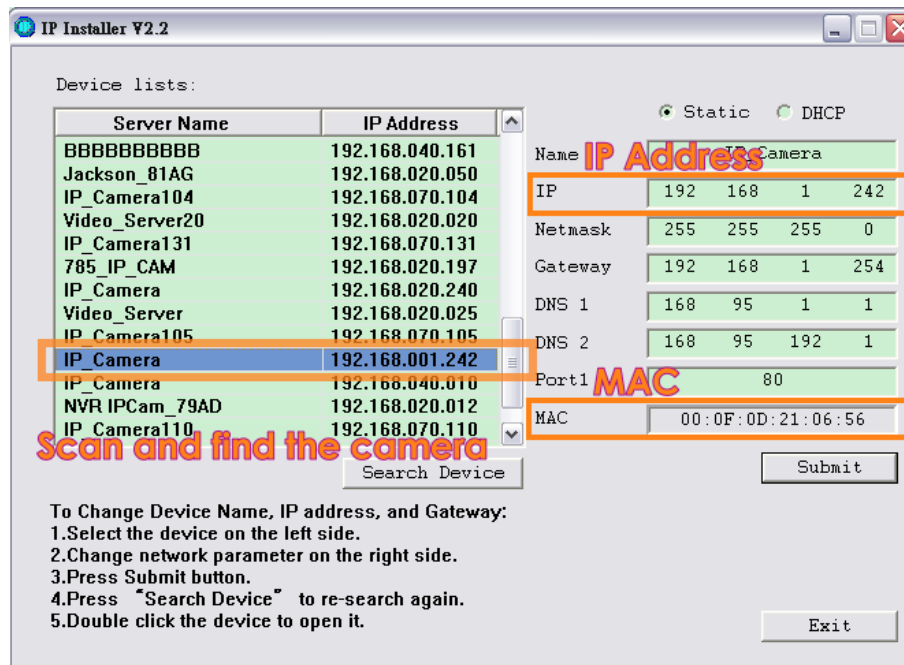
- Connect the power to the camera. Don't release the button during the system booting.
- It takes around 30 seconds to boot the camera.
- Release the button after the camera finishes booting.
- Plug in the ethernet cable. Re-login the camera using the default IP (<http://192.168.1.200>), and user name (admin), password (admin).

IX. Universal Password

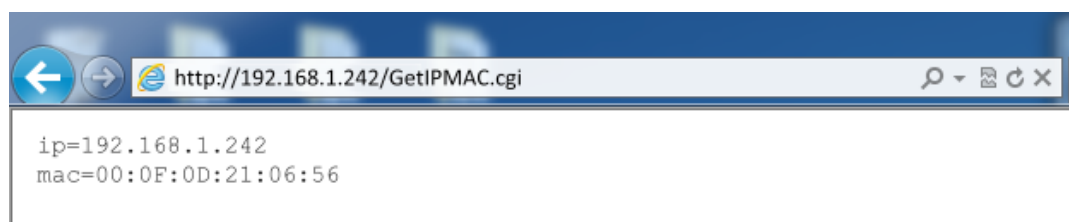
If you forgot the password of your IP camera, you can reset the camera to factory default, or follow the procedure below to generate a universal password.

Note: Universal password will be valid only when you enable the function in User Management.

1. First, you need to know the IP address and MAC of your IP camera. You can use IP installer to scan the LAN, and see the IP address and MAC on the side column.



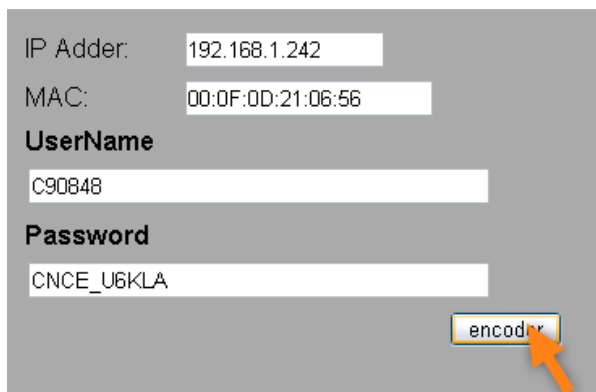
Or, if you already know the IP address of camera: Open the web browser, key in "http:// (IP address) /GetIPMAC.cgi" and press enter. The IP address and MAC will be displayed on browser.



2. Find the .html file named "Universal Password" in CD-ROM. Click to open it.



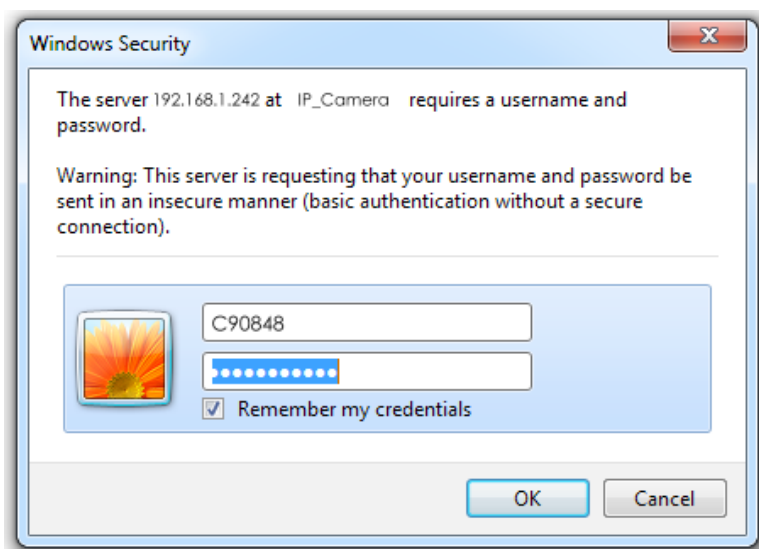
3. Key in the camera IP address in “IP Address” column and MAC in “MAC” column, and then click “encoder”. You will see a set of username and password appear, as below:



A screenshot of a web interface for configuring an IP camera. It features two input fields: "IP Address" with the value "192.168.1.242" and "MAC" with the value "00:0F:0D:21:06:56". Below these are two more input fields: "UserName" with the value "C90848" and "Password" with the value "CNCE_U6KLA". At the bottom right, there is a button labeled "encoder" with an orange arrow pointing to it.

The universal username and password are generated from the IP address and MAC you key in, so if you change the camera IP address, the universal password changes, too.

4. Take the picture for example, the universal username is “C90848” and password is “CNCE_U6KLA”. Use them to log in the camera.



5. Now you are logging in as administrator. Turn to User Management page. The use of universal password does not affect the previous user setting, so the administrator account password does not change until you edit it. Please click “Edit” to give a new administrator password.

The screenshot displays the IP Camera web interface. On the left, a sidebar menu lists various settings categories: System, Network, A/V Setting, and Event. The 'User Management' option under the 'System' category is highlighted with an orange box. The main content area shows a 'User Setup' dialog box with fields for 'Username' (admin), 'Password', and 'Confirm'. An orange arrow points from the 'Password' field to the text 'Setup new Password'. Below the dialog box, a 'User List' table is visible, with the 'Edit' button for the 'admin' user highlighted by an orange box.

System Information
User Management
System Update

System
IP Setting
Advanced
PPPoE & DDNS
Server(Mail,FTP,...)

Network
Image Setting
Video Setting
Audio

A/V Setting
Event Setting
Schedule
I/O Setting
Log List

Event
SD Card

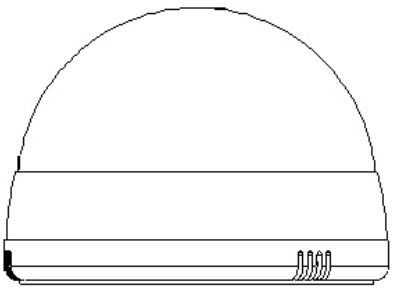
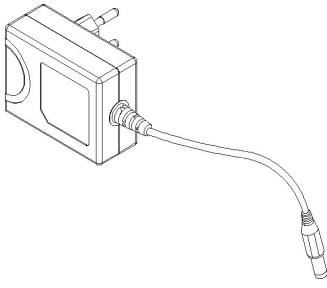
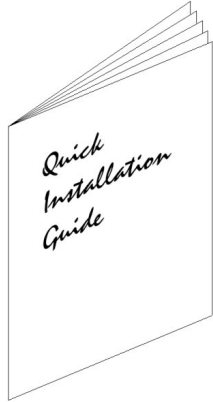
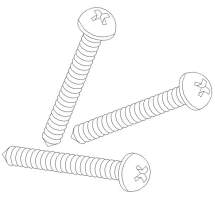
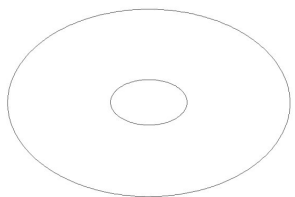
User Setup
Username: admin
Password:
Confirm:
OK

Setup new Password

User List

Username	User Group	Modify	Remove
admin	Administrator	Edit	-----

X. Package Contents

IP Camera	Adaptor	Quick Installation Guide
		
Screws x3	CD	
		

- Adaptor: AC100-240V DC12V/1A
- The CD includes User manual and software tools.

XII. Micro SD Card Compatibility

The following is the Micro SD Card recommended:

Transcend	SDHC	class4	16GB
	SDHC	class4	32GB
	SD	class4	16GB
	SD	class4	32GB
	SDHC	class6	4GB
	SDHC	class6	8GB
	SDHC	class6	16GB
	SD	class6	4GB
	SD	class6	8GB
	SD	class6	16GB
	SDHC	class10	4GB
	SDHC	class10	8GB
	SDHC	class10	16GB
SanDisk	SDHC	class4	4GB
	SDHC	class4	8GB
	SDHC	class4	16GB
	SDHC	class4	32GB